

6137 v.2 of 4



**FORT DEVENS
FEASIBILITY STUDY
FOR GROUP 1A SITES**

**FINAL
REMEDIAL INVESTIGATION ADDENDUM REPORT
DATA ITEM A009**

**VOLUME II OF IV
APPENDICES A - G**

CONTRACT DAAA15-91-D-0008

**U.S. ARMY ENVIRONMENTAL CENTER
ABERDEEN PROVING GROUND, MARYLAND**

DECEMBER 1993

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**REMEDIAL INVESTIGATION ADDENDUM REPORT
FORT DEVENS FEASIBILITY STUDY FOR GROUP 1A SITES**

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ABB Environmental Services, Inc.

APPENDIX A
SOIL AND SEDIMENT BORING LOGS

SHM-93-01A
SHM-93-10C
SHM-93-18B
SHM-93-22C
SHM-93-24A
SHB-93-01X
CSM-93-01A
CSM-93-02A
CSM-93-02B
SHD-92-01X
SHD-92-02X
SHD-92-03X
SHD-92-04X
SHD-92-05X
SHD-92-06X
SHD-92-07X
SHD-92-08X
SHD-92-09X
SHD-92-10X
SHD-92-11X
SHD-92-12X
SHD-92-13X
SHD-92-14X
SHD-92-15X
SHD-92-16X
SHD-92-17X
SHD-92-18X
SHD-92-19X
SHD-92-20X
SHD-92-21X
SHD-92-22X
SHD-92-23X
SHD-92-24X
SHD-92-25X
CSD-92-01X
CSD-92-02X
CSD-92-03X
CSD-93-04X
CSD-92-05X
CSD-92-06X
CSD-92-07X
CSD-92-08X
CSD-92-09X
CSD-92-10X

SOIL BORING LOG					Study Area: Shepley's Hill Landfill		
Client: AEC			Project No. 7005-04		Boring No.: SHM-93-01A		
Contractor: New Hampshire Boring			Date Started: 01/21/93		Completed: 01/21/93		Method: HSA
Ground Elev.: 235.5 ft.			Soil Drilled: 26 ft.		Total Depth: 26 ft.		Casing Size: 6.25 ID
Logged by: RRR			Checked by: DSP		Groundwater Below Ground: 20 ft.		
Screen: 10 (ft)		Riser: 18 (ft)		Diam.: 4.0" (ID)	Material: Sch 40PVC	Protection: Mod.D	Page 1 of 1
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PEN. — REC.	PID (ppm)	SOIL-ROCK DESCRIPTION	BLOWS\6-IN.	COMMENTS
2	S-1	0'-2'	1.5 ----- 2.0	BKG	0'-1.4' SAND, poorly graded, medium, 10% coarse, 10% fine, 0'-2' gravel subrounded, tannish brown, medium dense (SP) 1.4'-1.5' SAND, poorly graded, fine, 0-2% silt, subangular, dry, medium dense, tannish brown (SP)	6-13-13-14	Start 0940
6	S-2	5'-7'	1.7 ----- 2.0	BKG	SAND, poorly graded, fine, 15% medium, subangular, dry, very loose, light brown (SP)	3-4-5-5	
12	S-3	10-12	1.8 ----- 2.0	BKG	SAND, similar to above (SP)	3-4-4-6	
16	S-4	15-17	1.6 ----- 2.0	BKG	0'-1.5 SAND, similar to above, banding (SP) 1.5'-1.6' and in shoe, SAND, well graded, medium to coarse sand and gravel, subangular to angular, damp, loose, light brown (SW)	3-5-9-12	Change
22	S-5	20-22	1.6 ----- 2.0	BKG	0'-0.6' SAND, poorly graded, fine to medium, rounded, very loose, wet, dark brown (SP) 0.6'-1.6' gravely SAND, poorly graded, coarse, 10% medium, very loose, subrounded, wet, reddish brown (SP)	2-4-4-6 2-4-4-6	Water at 20' bgs TOC Analytical collected
26	S-6	25 - 25.5	0.6 ----- 2.0	BKG	Sandy SILT, rock in shoe, cobbles of low grade metamorphosed rock in silt (SP-SM)	5-50 for 4"	Rock in shoe
28					BOE = 26' bgs, 1245 hours, 1/21/93		
30					Refusal on rock		

SOIL BORING LOG						Study Area: Shepley's Hill Landfill					
Client: AEC			Project No. 7005-04			Boring No.: SHM-93-10C					
Contractor: New Hampshire Boring			Date Started: 02/09/93			Completed: 2/12/93		Method: HSA/Case/Core			
Ground Elev.: 247.5 ft.			Soil Drilled: 36.5 ft.			Total Depth: 59.5 ft.		Casing Size: 6"			
Logged by: RRR			Checked by: DSP			Groundwater Below Ground: 29.5 ft.					
Screen: 10 (ft)		Riser: 45 (ft)		Diam.: 4.0" (ID)		Material: Sch 40PVC		Protection: Mod.D		Page 1 of 2	
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PEN. — REC.	PID (ppm)	SOIL-ROCK DESCRIPTION			BLOWS\6-IN.		COMMENTS	
2	S-1	0-2	1.5 ----- 2.0	BKG	SAND, poorly graded, medium, 5% fine, 5% coarse, rounded, dry, medium dense, 7.5 yr 6/3 light brown, aeolian, glacial outwash (SP)			16-10-12-12			
4											
6	S-2	5-7	1.6 ----- 2.0	BKG	SAND, poorly graded, similar to above but loose, dry (SP)			6-5-5-6			
8											
10	S-3	10-12	1.4 ----- 2.0	BKG	SAND, similar to above (SP)			4-6-6-4			
12											
14											
16	S-4	15-17	1.6 ----- 2.0	BKG	SAND, similar to above but very loose, dry (SP)			4-4-4-5			
18											
20	S-5	20-22	1.7 ----- 2.0	BKG	SAND, similar to above (SP)			4-4-6-6			
22											
24											
26	S-6	25-27	1.9 ----- 2.0	BKG	SAND, similar to above, medium dense, 10 yr 6/3 pale brown (SP)			7-10-14-19			
28											
29										Water at 29' bgs	

SOIL BORING LOG					Study Area: Shepley's Hill Landfill		
Client: AEC			Project No. 7005-04		Boring No.: SHM-93-10C		
Contractor: New Hampshire Boring			Date Started: 02/09/93		Completed: 02/12/93		Method: HSA/Case/Core
Ground Elev.: 247.5 ft.			Soil Drilled: 36.5 ft.		Total Depth: 59.5 ft.		Casing Size: 6"
Logged by: RRR			Checked by: DSP		Groundwater Below Ground: 29.5 ft		
Screen: 10 (ft)		Riser: 45 (ft)		Diam.: 4.0" (ID)	Material: Sch 40PVC	Protection: Mod.D	Page 2 of 2
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PEN. — REC.	PID (ppm)	SOIL-ROCK DESCRIPTION	BLOWS\6-IN.	COMMENTS
30	S-7	30-32	1.8	BKG	Sand to silty sand, poorly graded, fine, subrounded, medium dense, wet, 10% silt, 7.5 yr 5/6 strong brown, coarse piece of subangular gravel at 1.4' (SP-SM)	16-13-13-12	
32			-----				
34			2.0				
36	S-8	35 - 36.5	1.5	BKG	Similar to above, weathered rock frags near bottom of spoon (SP-SM)	WOR/1/50-4"	
38			-----				
40			2.0				
42					Bedrock		
44					36.5' will core rest of hole; see attached core logs.		
46							
48							
50							
52							
54							
56							
58							






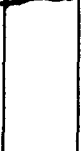
ROCK CORING LOG

Project: Fort Devens		Study Area: SHL		Project No. 07005-04	
Client: USATHAMA		Driller's Name: G. LEVITT		Logged by: RRR	Checked by:
Drilling Contractor: NAB		Protection Level: MODIFIED D		Rig Type: B-53	Start Date: 2-9-93
Drilling Method: HQ 6" CASING : CORE : OVERDRAM 5 5/8"		P.T.D. (eV): FID OVA		Casing Size: 6"	Finish Date: 2-12-93
Bit type/size: HQ 15 = .21" O.D. = .32"		Bit Use: NEW		Core Interval (to/from)(ft): 36.5 → 41.5	

Depth (feet) Below GRD Sort.	Sample No. & Penetration/ Recovery (feet)	Graphic Log	Natural Cove Breaks		Weathered Condition	Rock Quality			Drilling Rate min/ft	Color	Rock Description and Comments on Drilling
			Type/Dip	Surface Condition		Total 4" Core	RQD (%)	Rock Quality Description			
37.0			X 20°	FRESH (F) WEATHERED (W)					↑		X = MECHANICAL / = NATURAL (SOLUTION STRESS EROSIONAL) LOW TO MEDIUM GRADE META-PELITIC SILTSTONES. SECONDARY QUARTZ FOUND IN BOTH HAZED AND OPEN FRACTURES. BEDDING APPEARS TO BE DIPPING @ 45-55°. ROCK IS BLACK/GREY WHEN WET. DRIES TO A DARK GREY. PRIMARILY SILICICLASTIC W/ SECONDARY QUARTZ AND SULFIDES ALONG FRACTURES.
37.5			X	F					↓		
38			X	F					↑		
38.5	4.8 5.0		10:40°	W		4.1	82%	GOOD	↓		
39			X	F		5.0			↑		
39.5			80°	W					↓		
40			X	F					↑		
40.5			X	F					↓		
41			X 60°	W					↑		
41.5			X	F					↓		







ROCK CORING LOG

Project: Fort Devens		Study Area: SUM-93-106		Project No. 07005-04	
Client: USATHAMA		Driller's Name:		Logged by: RRR	Checked by:
Drilling Contractor:		Protection Level:		Rig Type: B 53	Start Date:
Drilling Method:		P.I.D. (eV):		Casing Size:	Auger Size:
Bit type/size: 1/4		Bit Use: HR		Core Interval (to/from)(ft): 41.5 - 46.5	
				Run # 2	

Depth (feet) Below GRD Sort.	Sample No. & Penetration/ Recovery (feet)	Graphic Log	Natural Cove Breaks		Weathered Condition	Rock Quality			Drilling Rate min/ft	Color	Rock Description and Comments on Drilling
			Type/Dip	Surface Condition		Total 4" Core	RQD (%)	Rock Quality Description			
42	Run # 2		X	F					5		META-PELITIC SILTSTONES. LOW TO MEDIUM GRADE SILICICLASTIC w/ SECONDARY QUARTZ AND SULFIDES ALONG FRACTURES AND SOLUTION CAVITIES FRACTURES MIMIC BEDDING PLANES PRIMARILY. GETTING GOOD RETURN ON CIRCULATION WATER DESPITE EXTENSIVE SOLUTION CAVITIES
43	5.0 5.0		X	F		5.0	100%	Exc.	5		
44			X	F					6		
45			X	F					5		
46			X	F					6		
46.5			X	F							

ROCK CORING LOG

Project: Fort Devens		Study Area: SHM-93-100		Project No.	
Client: USATHAMA		Driller's Name:		Logged by:	Ground Elev.:
Drilling Contractor:		Protection Level:		Rig Type: B-53	Start Date: 2-9-93
Drilling Method:		P.T.D. (eV): F15/6VA		Casing Size:	Auger Size:
Bit type/size: HQ		Bit Use:		Core Interval (to/from)(ft): 46.5 → 51.5 Run # 3	

Depth (feet) Below GRD Sort.	Sample No. & Penetration/ Recovery (feet)	Graphic Log	Natural Cove Breaks		Weathered Condition	Rock Quality			Drilling Rate min/ft	Color	Rock Description and Comments on Drilling
			Type/Dip	Surface Condition		Total 4" Core	RQD (%)	Rock Quality Description			
47	46.5 ↓ 51.5		X (F)						6	MOTTLED LIGHT TO DARK GREY	META-PELTIC SILTSTONE LOW TO MEDIUM GRADE. GROWING MORE COMPETENT w/ DEPTH SULFIDES AND SECONDARY QUARTZ ALONG FRACTURE PLANES
48				HEALED FRAC / SOLUTION		5.0	5.0 / 5.0	EXC	7		SOLUTION CAVITY CONTAINING SILICLASTICS LOST WATER AT THIS POINT
49	5.0 / 5.0								8		
50			X (F)						7		
51			X (F)						8		HEALED FRACTURES ALONG BEDDING PLANES. SECONDARY QUARTZ
51.5			X (F)								





ROCK CORING LOG

Project: Fort Devens		Study Area: SUM-93-10C		Project No.	
Client: USATHAMA		Driller's Name:		Logged by:	Checked by: Ground Elev.:
Drilling Contractor:		Protection Level:		Rig Type:	Start Date: Finish Date:
Drilling Method:				P.I.D. (eV):	Casing Size: Auger Size:
Bit type/size:		Bit Use:		Core Interval (to/from)(ft): 51.5 → 56.5	

Depth (feet) Below GRD Sort.	Sample No. & Penetration/ Recovery (feet)	Graphic Log	Natural Cove Breaks		Weathered Condition	Rock Quality			Drilling Rate min/ft	Color	Rock Description and Comments on Drilling
			Type/Dip	Surface Condition		Total 4" Core	RQD (%)	Rock Quality Description			
52	RUN # 4		150°	X					7		SAME AS PREVIOUS CORE
53	5.0 5.0		X	HEALED		5.0	100%	EXC.	5		
54			X						7		
55			X						7		
56			X						9		
56.5			X								

ROCK CORING LOG

Project: Fort Devens		Study Area: SWM-93-10C		Project No. 07005-04
Client: USATHAMA	Driller's Name:	Logged by: JRR	Checked by:	Ground Elev.:
Drilling Contractor:	Protection Level:	Rig Type: B-53	Start Date: 2-9-93	Finish Date: 2-12-93
Drilling Method:		P.I.D. (eV): FID/OVA	Casing Size: 6"	Auger Size:
Bit type/size:	Bit Use:	Core Interval (to/from)(ft): 56.5 - 59.5 3 FT		

Depth (feet) Below GRD Sort.	Sample No. & Penetration/ Recovery (feet)	Graphic Log	Natural Core Breaks		Weathered Condition	Rock Quality			Drilling Rate min/ft	Color	Rock Description and Comments on Drilling
			Type/Dip	Surface Condition		Total 4" Core	RQD (%)	Rock Quality Description			
57	Run # 5 (RQD)		x	F					7		META PELITIC SILTSTONE FOLIATION BECOMING NEARLY VERTICAL IN MIDDLE OF THE SAMPLE ROCK IS MOTTLED WHITE-GREY SILICICLASTIC IN ORIGIN CONTAINING BOTH PRIMARY AND SECONDARY QUARTZ
58	3.0 3.0					3'	100%	EXL	7		
59			x	F					7		
59.5			x	F							

SOIL BORING LOG					Study Area: Shepley's Hill Landfill			
Client: AEC			Project No. 7005-04		Boring No.: SHM-93-18B			
Contractor: New Hampshire Boring			Date Started: 02/04/93		Completed: 02/08/93		Method: HSA	
Ground Elev.: 235.7 ft.			Soil Drilled: 93.5 ft.		Total Depth: 93.5 ft.		Casing Size: 6.25" ID	
Logged by: RRR			Checked by: DSP		Groundwater Below Ground: 14 ft.			
Screen: 10 (ft)		Riser: 80 (ft)		Diam.: 4.0" (ID)	Material: Sch 40PVC	Protection: Mod.D	Page 1 of 4	
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PEN. — REC.	PID (ppm)	SOIL-ROCK DESCRIPTION		BLOWS\6-IN.	COMMENTS
2	S-1	0'-2'	1.3 ----- 2.0	BKG	SAND, poorly graded, medium to coarse, 5-10% ifne, subangular, loose, sample is dry but entirely frozen, 7.5 yr 7/2 pinkish gray, glacial outwash, aeolan (SP)		31-21-4-3	Change at 15.5 ft.
4								
6	S-2	5'-7'	1.2 ----- 2.0	BKG	SAND, poorly graded, fine to medium, 1-2% silt, subrounded, medium dense, dry, 7.5 yr 7/2 pinkish gray, glacial outwash (SP)		11-16-27-23	
8								
10								
12	S-3	10-12	1.3 ----- 2.0	BKG	SAND, similar to above (SP) At 1.0' SAND is banded with silty sand, fine, loose, 2.5 yr 4/6 yellowish red, moist, resembles liesgang banding (SP-SM)		6-6-6-13	
14								
16	S-4	15-17	1.5 ----- 2.0	BKG	0'-0.5' SAND, well graded, medium to coarse, 15-20% fine, 10% silt, medium dense, wet, 10 yr 4/4 dark yellowish brown (SW-SM) 0.5'-1.5' SAND, poorly graded, medium, 5% coarse, 5% fine, medium dense, wet, 10 yr 6/3 pale brown (SP)		6-8-6-13	
18								
20								
22	S-5	20-22	1.8 ----- 2.0	BKG	SAND, poorly graded, medium, 5% coarse, 5% fine, medium dense, wet, 10 yr 6/3 pale brown (SP)		6-10-12-13	
24								
26	S-6	25-27	1.7 ----- 2.0	BKG	SAND, poorly graded, similar to above (SP)		WOR to 18"/9	
28								
30								

SOIL BORING LOG						Study Area: Shepley's Hill Landfill		
Client: AEC			Project No. 7005-04			Boring No.: SHM-93-18B		
Contractor: New Hampshire Boring			Date Started: 02/04/93			Completed: 02/08/93		Method: HSA
Ground Elev.: 235.7			Soil Drilled: 93.5 ft.			Total Depth: 93.5		Casing Size: 6.25" ID
Logged by: RRR/LEF			Checked by: DSP			Groundwater Below Ground: 14'		
Screen: 10 (ft)		Riser: 80 (ft)		Diam.: 4.0" (ID)	Material: Sch 40PVC	Protection: Mod.D	Page 2 of 4	
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PEN. — REC.	PID (ppm)	SOIL-ROCK DESCRIPTION		BLOWS\6-IN.	COMMENTS
32	S-7	30-32	2.0 ----- 2.0	BKG	SAND, poorly graded, similar to above (SP)		WOH 1/2/5	SP
34								
36	S-8	35-37	2.0 ----- 2.0	BKG	SAND, poorly graded, similar to above except 5 yr 6/4 reddish brown (SP)		3-8-12-22	SP
38								
40								
42	S-9	40-42	0.0 ----- 2.0	BKG	Residual sand in spoon was similar to above (SP)		6-6-11-16	Sampled and drilled with 4 1/4" augers to 40'. Hole blew in to 35' bgs. Try to add head of water. Adding water was ineffective. Will telescope 3" casing inside of augers and procede from 40'. Decide to make another attempt with augers using twine to keep connections watertight.
44								
46	S-10	45-47	0.7 ----- 2.0	BKG	SAND, poorly graded, similar to above (SP)		7/12/50-4	
48								
50								
52	S-11	50-52	0.0 ----- 2.0	BKG	Soils are running out of spoon when we are retrieving it		8/12/24/30	
54								1' of sand heaved up inside of augers. Sand is flowing out of spoon when it is retrieved.
56	S-12	55-57	0.7 ----- 2.0	BKG	SAND, similar to above (SP)		9/15/22/24	
58								Sample mostly represents soils which have heaved into augers.
60	S-13	58-60	0.0 ----- 2.0	BKG	No recovery, sands are running out of spoon		6/6/9/13	

SOIL BORING LOG					Study Area: Shepley's Hill Landfill			
Client: AEC			Project No. 7005-04		Boring No.: SHM-93-18B			
Contractor: New Hampshire Boring			Date Started: 02/04/93		Completed: 02/08/93		Method: HSA	
Ground Elev.: 235.7 ft.			Soil Drilled: 93.5 ft.		Total Depth: 93.5		Casing Size: 6.25" ID	
Logged by: RRR/LEF			Checked by: DSP		Groundwater Below Ground: 14 ft.			
Screen: 10 (ft)		Riser: 80 (ft)		Diam.: 4.0" (ID)	Material: Sch 40PVC	Protection: Mod.D	Page 3 of 4	
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PEN. — REC.	PID (ppm)	SOIL-ROCK DESCRIPTION		BLOWS\6-IN.	COMMENTS
62								<u>2/4/93</u> <u>2/5/93</u>
64								
66					No spoon attempted			
68								
70	S-14	69-71	0.9 ----- 2.0	BKG	SAND, poorly graded, fine, 15% medium, subangular, medium dense, wet, 10 yr 5/3 brown, glacial outwash (SP)		4/10/19/24	
72								
74	S-15	74-76		BKG	SAND, similar to above but medium dense to dense (SP)		6/18/31/49	<u>2/5/93</u> <u>2/8/93</u>
76								
78	S-16	78-80	0.8 ----- 2.0	BKG	SAND, similar to above. At 0.1' and 0.3' there are 0.1' thick bands of SAND, medium to coarse, well graded, 20% fines, 5% silt, subrounded to rounded, medium dense, wet, 10 R 4/6 red (SW-SP)		10/15/29/29	
80								
82								
84	S-17	83-85	1.8 ----- 2.0	BKG	SAND, poorly graded, fine to medium, subrounded, loose, wet, 7.5 yr 5/4, brown, glacial outwash (SP)		3/2/7/15	
86								
88	S-18	88-90	1.4 ----- 2.0	BKG	SAND, similar to above, medium dense (SP)		23/18/24/29	
80								

SOIL BORING LOG					Study Area: Shepley's Hill Landfill		
Client: AEC		Project No. 7005-04		Boring No.: SHM-93-18B			
Contractor: New Hampshire Boring		Date Started: 02/04/93		Completed: 02/08/93		Method: HSA	
Ground Elev.: 235.7 ft.		Soil Drilled: 93.5		Total Depth: 93.5 ft.		Casing Size: 6.25" ID	
Logged by: RRR/LEF		Checked by: DSP		Groundwater Below Ground: 14 ft.			
Screen: 10 (ft)		Riser: 80 (ft)		Diam.: 4.0" (ID)	Material: Sch 40PVC	Protection: Mod.D	
Page 4		of 4					
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PEN. — REC.	PID (ppm)	SOIL-ROCK DESCRIPTION	BLOWS\6-IN.	COMMENTS
92							
94					Refusal at 93.5'-Cuttings indicate bedrock-metamorphosed schistose rock		
96							
98							
100							
102							
104							
106							
108							
110							
112							
114							
116							
118							
120							

SOIL BORING LOG					Study Area: Shepley's Hill Landfill			
Client: AEC			Project No. 7005-04		Boring No.: SHM-93-22C			
Contractor: New Hampshire Boring			Date Started: 02/11/93		Completed: 02/25/93		Method: Drive/Wash	
Ground Elev.: 217.9			Soil Drilled: 115 ft.		Total Depth: 135 ft.		Casing Size: 6"	
Logged by: LET			Checked by: RRR		Groundwater Below Ground: 5.9 ft.			
Screen: 10 (ft)		Riser: 127 (ft)		Diam.: 4.0" (ID)	Material: Sch 40PVC	Protection: Mod.D	Page 1 of 1	
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PEN. — REC.	PID (ppm)	SOIL-ROCK DESCRIPTION		BLOWS\6-IN.	COMMENTS
1					No split-spoons collected (see soil boring log for SHL-22 installed by Ecology and Environment)			
115					Bedrock at 115' bgs, see core logs for rock descriptions			

ROCK CORING LOG

Project: Fort Devens		Study Area: SHL		Project No. 7005-04
Client: USATHAMA	Driller's Name: G. Trombly	Logged by: J. Swonsden	Checked by:	Ground Elev.:
Drilling Contractor: New Hampshire Boring	Protection Level: Level D	Rig Type: Mobile B	Start Date: 2/19/93	Finish Date: 2/25/93
Drilling Method: 6.0" casing and HX rock core		P.I.D. (eV):	Casing Size: 6.0"	Auger Size:
Bit type/size: HX	Bit Use:	Core Interval (to/from)(ft): 115.0' to 120.5' R-1		

Depth (feet) Below GRD Sort.	Sample No. & Penetration/ Recovery (feet)	Graphic Log	Natural Core Breaks		Weathered Condition	Rock Quality			Drilling Rate min/ft	Color	Rock Description and Comments on Drilling
			Type/Dip	Surface Condition		Total 4" Core	RQD (%)	Rock Quality Description			
115			X	F			2.5		7 min		x - mechanical / - natural W - weathered Meta pelitic siltstone w/ apparent quartz/quartzite interstratifications in bedded and open fractures. The bedding and majority of fractures are dipping @ ~ 50°
116							1.9		5 min	Greenish Gray wet	
117			/	W					5 min		
118	5.0						2.0		3 min		
119	5.0		X	F					4 min		
120			X	F			0.6				
121		End of R-1	X	F			3.5				
							5.0				

ROCK CORING LOG

Project: Fort Devens		Study Area: SHL		Project No. 7005-04	
Client: USATHAMA		Driller's Name: G. Twombly		Logged by: J. Snowden	Checked by:
Drilling Contractor: New Hampshire Boring		Protection Level: Level D		Rig Type: Model B-57	Start Date: 2/19/93
Drilling Method: 6.0" ID casing and #X rock core		P.I.D. (eV):		Casing Size: 6.0"	Auger Size:
Bit type/size:		Bit Use:		Core Interval (to/from)(ft): 120.0' to 125.0' R-2	

Depth (feet) Below GRD Sort.	Sample No. & Penetration/ Recovery (feet)	Graphic Log	Natural Core Breaks		Weathered Condition	Rock Quality			Drilling Rate min/ft	Color	Rock Description and Comments on Drilling
			Type/Dip	Surface Condition		Total 4" Core	RQD (%)	Rock Quality Description			
120									5 min		X-mechanical break /-natural fracture Similar to R-1
121									1 min	Grayish Green wet	
122	5.0	X Healed Frac.				4.8'			3 min	Light Grey dry	
123	5.0	X							4 min		
124		X									
125		X							5 min		
		End of R-2									

ROCK CORING LOG

Project: Fort Devens		Study Area: JHL		Project No. 7005-04	
Client: USATHAMA		Driller's Name: G. Twombly		Logged by: J. Snowden	Checked by: Ground Elev.:
Drilling Contractor: New Hampshire Boring		Protection Level: Level D		Rig Type: Mobile B-57	Start Date: 7/19/93 Finish Date: 2/25/93
Drilling Method: 6.0" casing and HX rock core		P.I.D. (eV):		Casing Size: 6.0"	Auger Size:
Bit type/size:		Bit Use:		Core Interval (to/from)(ft): 125.0' to 130.0' R-3	

Depth (feet) Below GRD Surf.	Sample No. & Penetration/ Recovery (feet)	Graphic Log	Natural Core Breaks		Weathered Condition	Rock Quality			Drilling Rate min/ft	Color	Rock Description and Comments on Drilling
			Type/Dip	Surface Condition		Total 4" Core	RQD (%)	Rock Quality Description			
125		X	X	F					3 min		X-mechanical break Similar to R-1
126		X	X	F					4 min		
127	5.0 5.0	X	X	F		5.0	100%	Excellent	4 min		
128		X	X	F					5 min		
129		X	X	F					3 min		
130		End of R-3		F							

ROCK CORING LOG

Project: Fort Devens		Study Area: SHL		Project No. 7005-04	
Client: USATHAMA		Driller's Name: G. Townsend		Logged by: J. Snowden	Checked by: Ground Elev.:
Drilling Contractor: New Hampshire Boring		Protection Level: Level D		Rig Type: Model B-57	Start Date: 2/19/93
Drilling Method: 6.0" casing and HX rock core		P.I.D. (eV):		Casing Size: 6.0"	Auger Size:
Bit type/size: HX		Bit Use:		Core Interval (to/from)(ft): R-4 130'-135'	

Depth (feet) Below GRD Sort.	Sample No. & Penetration/ Recovery (feet)	Graphic Log	Natural Core Breaks		Weathered Condition	Rock Quality			Drilling Rate min/ft	Color	Rock Description and Comments on Drilling
			Type/Dip	Surface Condition		Total 4" Core	RQD (%)	Rock Quality Description			
130			x						4		x-mechanical break Similar to R-1 Greenish Gray wet Light Gray Dry
131			x						5		
132	4.9' 5.0'		x			4.9	100%	Excellent	4		
133			x						4		
134			x						4		
135			x						4		Bottom of boring at 135'
		End of R-4									

SOIL BORING LOG						Study Area: Shepley's Hill Landfill					
Client: AEC			Project No. 7005-04			Boring No.: SHM-93-24A					
Contractor: New Hampshire Boring			Date Started: 01/20/93			Completed: 01/20/93		Method: HSA			
Ground Elev.: 235.5			Soil Drilled: 24 ft.			Total Depth: 24 ft.		Casing Size: 6.25 ID			
Logged by: RRR			Checked by: DSP			Groundwater Below Ground: 15.5 ft.					
Screen: 10		(ft)	Riser: 16		(ft)	Diam.: 4.0"	(ID)	Material: Sch 40PVC	Protection: Mod.D	Page 1	of 2
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH (FT)	REC. — PEN.	PID (ppm)	SOIL-ROCK DESCRIPTION				BLOWS\6-IN.	COMMENTS	
1	S-1	0'-2'	1.2 ----- 2.0	BKG	0'-0.5' SAND, well graded, fine to medium , 20% coarse, 3.5 silt, angular, very loose, dry, dark brown, glacial outwash topsoil (SW) 0.5'-1.2' SAND, well graded,medium to coarse, 20% fine sand, subangular, dry, very loose, tannish brown (SW)				2-3-3-2	Start 11:30	
2											
3											
4											
5	S-2	5'-7'	1.4 ----- 2.0	BKG	SAND, well graded, medium to coarse, 20% fine sand, similar to above, coarse fraction increasing with depth to 35-40% (SW)				6-8-9-10		
6											
7											
8											
9											
10											
11	S-3	10-12	1.5 ----- 2.0	BKG	SAND, poorly graded, medium, 15% sand, 15% coarse, subrounded, dry, loose, (PR), tan, brown (SP)				7-4-6-6		
12											
13											
14											

SOIL BORING LOG					Study Area: Shepley's Hill Landfill		
Client: AEC		Project No. 7005-04		Boring No.: SHM-93-24A			
Contractor: New Hampshire Boring		Date Started: 01/20/93		Completed: 01/20/93		Method: HSA	
Ground Elev.: 235.5		Soil Drilled: 24 ft.		Total Depth: 24 ft.		Casing Size: 6.25 ID	
Logged by: RRR		Checked by: DSP		Groundwater Below Ground: 15.5 ft.			
Screen: 10 (ft)		Riser: 16 (ft)		Diam.: 4.0" (ID)	Material: Sch 40PVC	Protection: Mod.D	
Page 2		of 2					
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PEN. — REC.	PID (ppm)	SOIL-ROCK DESCRIPTION	BLOWS\6-IN.	COMMENTS
15							
16	S-4	15-17	1.5 ----- 2.0	BKG	SAND, similar to above except very loose and wet (SP)	4/4/6/7	Water at 15' TOC analytical collected
17							
18							
19							
20							
21	S-5	20-22	1.8 ----- 2.0	BKG	SAND, poorly graded, similar to above (SP)	0-2-3-6	
22							
23							
24					BOE = 1440 hours 1/20/93		
25							
26							
27							
28							

SOIL BORING LOG						Study Area: Shepley's Hill Landfill	
Client: AEC			Project No. 7005-04			Boring No.: SHB-93-01X	
Contractor: New Hampshire Boring			Date Started: 01/25/93			Completed: 01/25/93	Method: HSA
Ground Elev.: 235.5 ft.			Soil Drilled: 25 ft.			Total Depth: 25 ft.	Casing Size: 4.25" ID
Logged by: LET			Checked by: RRR			Groundwater Below Ground: 19 ft.	
Screen: N/A (ft)		Riser: N/A (ft)	Diam.: N/A (ID)	Material: N/A		Protection: Mod.D	Page 1 of 1
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PEN. — REC.	PID (ppm)	SOIL-ROCK DESCRIPTION	BLOWS\6-IN.	COMMENTS
0-5	(1)				SAND, medium , dry, fill, 10 yr 5/4 yellowish brown, 15% sand		
10	5-10	(2)			SAND, fine-medium, dry, yellowish brown		
	10-15	(3)		BKG	SAND, fine-medium, dry, yellowish brown		
20	15-20	(4)			Same		Loosened up at 19' (Water??)
	20-25	(5)			Same		Started to scratch at 24' bgs
	25-26	(6)			Same Material		
30					BOB 25' bgs		
40							
50							
60							
70							

SOIL BORING LOG						Study Area: Cold Spring Pond			
Client: AEC			Project No. 7005-04			Boring No.: CSM-93-01A			
Contractor: New Hampshire Boring			Date Started: 01/25/93			Completed: 02/03/93		Method:HSA Drive/Wash	
Ground Elev.: 254.8			Soil Drilled: 65.5 ft.			Total Depth: 65.5 ft.		Casing Size: Comments	
Logged by: LEF			Checked by: RRR			Groundwater Below Ground: 15.5			
Screen: 10 (ft)		Riser: (ft)		Diam.: 4.0" (ID)		Material: Sch 40PVC		Protection: Mod.D	Page 1 of 3
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PEN. — REC.	PID (ppm)	SOIL-ROCK DESCRIPTION			BLOWS\6-IN.	COMMENTS
2				BKG	GRAVEL, GM, well graded, 35-40% silty fine to coarse sand, sub-angular, loose, moist, dark brown (GM)				HSA to 19'
4									
6									
8									
10									
12									HSA
14									
16		15 - 16.25		BKG	FILL, 70% chunks of cement, 30% clay to coarse sand matrix, leached gray to reddish brown and dark gray mottling, well graded, moist, dense			22/35/50 for 0.25'	
18									19' bgs bottom of fill
20									
22		22-24		BKG	SAND, well graded, 10-15% fine, 10-15% gravel, peat matrix, dark gray, high angularity, moist lacustrine (SW)			2/2/3/4	6" casing to 39' bgs
24									
26		24-26		BKG	SAND, well graded, 15-20% gravel, 30% fine, some cement, dark brown gray fill (SW)				End of day 1/25/93
28					(some granite and brick in wash)				
30		28-30	0.45 ----- 2.0	BKG	SAND, well graded, fine to coarse sand, 10% gravel, 10% silt and clay, firm, moist, hue 10 yr 4/2 dark grayish brown high angularity (SW)			9/7/7/10	Rod 27.5' bgs
32					(Some wood in wash)				Casing 29' bgs End of day 01/26/93

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SOIL BORING LOG						Study Area: Cold Spring Pond		
Client: AEC			Project No. 7005-04			Boring No.: CSM-93-01A		
Contractor: New Hampshire Boring			Date Started: 01/25/93			Completed: 02/03/93		Method:HSA Drive/Wash
Ground Elev.: 254.8			Soil Drilled: 65.5 ft.			Total Depth: TE4		Casing Size: Comments
Logged by: LEF			Checked by: RRR			Groundwater Below Ground: 15.5 ft.		
Screen: 10 (ft)		Riser: 56 (ft)		Diam.: 4.0" (ID)	Material: Sch 40PVC	Protection: Mod.D	Page 2 of 3	
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PEN. — REC.	PID (ppm)	SOIL-ROCK DESCRIPTION		BLOWS\6-IN.	COMMENTS
34			0.6					
36		34.5 - 36.5	----- 2.0	BKG	PEAT, 100% organics, very small roots, reddish brown, 7.5 yr 3/3, dry, blacker above reddish dry part, dark-dark brown organic muckier in spoon basket (PT)		6/5/5/11	7.5 yr 3/3
38		36.5 - 38.5	----- 2.0	BKG	PEAT, same as above (PT)		15/17/21/24	Advance with 5" casing
40								
42								
44		42.5 - 44.5	----- 2.0	BKG	SILTY SAND, poor to moderately graded, 15-25% organics in clay-sized particles, no non-decomposed material, dark gray, stiff, moist (SM)		*3/2/4	*Weight of hammer drove first 6"
46								
48								
50		49-51	----- 2.0	BKG	Attempted spoon, silty fine sand, gray, moderately graded (SM)		6/5/5/13	Driller sees change in color, end of organics
52		51-53	----- 0.5	BKG	SAND, well graded, medium, 15% gravel, 10% or less fine, 10% coarse, loose, saturated, gray (SW)		6/7/11/12	Overdrove spoon
54								
56								
58								
60		59-61	----- 2.0	BKG	SAND, fine sand, 10-15% fine, firm, moist, 10 yr 3/2, poorly graded, uniform (SP-SM)		15/14/17/29	
62								

SOIL BORING LOG					Study Area: Cold Spring Brook		
Client: AEC		Project No. 7005-04			Boring No.: CSM-93-01A		
Contractor: New Hampshire Boring		Date Started: 01/25/93			Completed: 02/03/93		Method: HSA Drive/Wash
Ground Elev.: 254.8		Soil Drilled: 65.5 ft.			Total Depth: 65.5 ft.		Casing Size: Comments
Logged by: LEF		Checked by: RRR			Groundwater Below Ground:		
Screen: 10 (ft)		Riser: 56 (ft)		Diam.: 4.0" (ID)	Material: Sch 40PVC	Protection: Mod.D	Page 3 of 3
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PEN. REC.	PID (ppm)	SOIL-ROCK DESCRIPTION	BLOWS\6-IN.	COMMENTS
62							
64							
66		65.5 - 67.5	0.5 ----- 2.0	BKG	SAND, poorly graded, 10% fine, loose, moist, 10 yr 3/2, uniform (SP-SM)	10/9/16/24	Black pepper like particles in sand
68					BOB 67.5' bgs		
70							
72							
74							
76							
78							
80							
82							
84							
86							
88							
90							

SOIL BORING LOG						Study Area: Cold Spring Brook					
Client: AEC			Project No. 7005-04			Boring No.: CSM-93-02A					
Contractor: New Hampshire Boring			Date Started: 02/15/93			Completed: 02/23/93		Method:HSA/Drive/Wash			
Ground Elev.: 262.6			Soil Drilled: 129.6 ft.			Total Depth: 129.6 ft.		Casing Size: 3.0"			
Logged by: John Snowden			Checked by: DSP			Groundwater Below Ground: 23 ft.					
Screen: 10 (ft)		Riser: 20 (ft)		Diam.: 4.0" (ID)		Material: Sch 40PVC		Protection: Mod.D		Page 1 of 2	
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PEN. — REC.	PID (ppm)	SOIL-ROCK DESCRIPTION				BLOWS\6-IN.	COMMENTS	
5					0-10 ft-no soil samples collected. Material is fill used to build a pad for the drill rig.					2/15/93 begin drilling at 11:30 using 4.25 ID HSA	
10	S-1	10-12	1.2 ----- 2.0	BKG	SAND, fine-medium sand, 0-5% silt, 1-2% coarse sand, loose, moist to dry, light-brownish gray (10 yr 6/2) (SP)				10/12/12/13		
15	S-2	15-17	1.8 ----- 2.0	BKG	Similar to S-1 (SP)				6/10/5/9		
20	S-3	20-22	1.6 ----- 2.0	BKG	Similar to S-1 with some coarse sand seams (SP)				8/10/15/12		
25	S-4	25-27	0.8 ----- 2.0	BKG	SAND, medium sand, well graded, 10-15% coarse sand, loose, wet, nonplastic, light brownish-gray (10 yr 6/2) (SW)				9/13/15/16	Water encountered at 23'	
30	S-5	30-32	1.6 ----- 2.0	BKG	Similar to S-4 (SW)				8/11/15/16		
35	S-6	35-37	1.2 ----- 2.0	BKG	Similar to S-4 (SW)				10/12/12/14		
40	S-7	40-42	0.8 ----- 2.0	BKG	40'-41' Similar to S-4 (SW) 41'-42' SANDY SILT, fine sand silty with 5-15% medium gravel, poorly graded, firm, wet, pale brown (10 yr 6/3) (SP-SM)				9/11/11/13	Approx. 2' of sand has flowed into the augers. 3.0" ID flush joint casing will be used to advance the boring to bedrock.4.25" HSAs removed NHB personnel off-site at 1550.	
45	S-8	45-47			Sample from 45'-47' not collected due to flowing sands. Casing advanced to 50'.						
50	S-9	50-52			SAND, coarse to medium sand with 5% silt, poorly graded, loose, wet (SP)						
55	S-10	55-57	0.5 ----- 0.5	BKG	SAND, medium to coarse sand with 30% fine gravel, well graded, loose, wet, nonplastic (SW)				120 for .5'		
60	S-11	60-62	0.4 ----- 2.0	BKG	SAND, medium to fine sand, 5-10% coarse sand, well graded, loose, wet, nonplastic (10 yr 6/2) (SW)				9/13/11/15	2/16/93 begin drilling at 0900 with 3.0" casing. The gravel was weathered casing penetration is slow.	
65	S-12	65-67			No sample collected due to flowing sands						
70	S-13	70-72			No sample collected due to flowing sands					Change at 60' to fine sand, casing was advanced to 65' but 7' of	
75	S-14	75-77			No sample collected due to flowing sands						

SOIL BORING LOG						Study Area: Cold Spring Brook		
Client: AEC			Project No. 7005-04			Boring No.: CSM-93-02A		
Contractor: New Hampshire Boring			Date Started: 02/15/93			Completed: 02/23/93		Method:HSA/Drive/Wash
Ground Elev.: 262.6			Soil Drilled: 129.6 ft.			Total Depth: 129.6 ft.		Casing Size: 3.0"
Logged by: John Snowden			Checked by: DSP			Groundwater Below Ground: 23 ft.		
Screen: 10 (ft)		Riser: 20 (ft)		Diam.: 4.0" (ID)	Material: Sch 40PVC	Protection: Mod.D	Page 2 of 2	
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PEN. — REC.	PID (ppm)	SOIL-ROCK DESCRIPTION	BLOWS\6-IN.	COMMENTS	
80	S-15	80-82	1.1 ----- 2.0	BKG	Similar to S-11 with fine gravel in top of sample. Gravel does not appear to be related to this sample (SW)	56/42/38/41	fine sand ran up into the casing. Casing was advanced to 70' without sampling 65'-67'. Cuttings from 65' to 70' appear to be similar to S-11. Drilling operations ended at 1500 due to heavy snow (stopped at 75').	
85	S-16	85-87	0.0 ----- 2.0	BKG	No recovery-material in spoon appears to be wash	30/20/22/28		
90	S-17	90-92	0.4 ----- 2.0	BKG	Similar to S-11 with coarse gray chips (20%) (SW)	30/22/32/40		
95	S-18	95-97	1.1 ----- 2.0	BKG	Similar to S-11 (SW)	4/7/6/17		
100	S-19	100 - 102	0.5 ----- 2.0	BKG	SAND, fine sand with 20% medium sand, well graded, loose, wet, light brownish gray (10 yr 6/2) (SW)	18/16/29/40	2/17/93 began drilling at 0950 at 75'.	
105	S-20	105 - 107	1.1 ----- 2.0	BKG	SAND, fine to medium with 5% coarse sand, loose, poorly graded, wet, light brownish gray (10 yr 6/2) (SP)	9/9/15/21		
110	S-21	110 - 112	0.7 ----- 2.0	BKG	GRAVELY SAND, fine rounded gravelly coarse sand with 5% medium sand, well graded, medium dense, wet (SW-GW)	20/16/19/21		
115	S-22	115 - 117	0.8 ----- 2.0	BKG	SAND, medium to coarse sand with 5% fine sand, well graded, loose, wet, nonplastic, light brownish gray (10 hr 6/2) (SW)	25/19/18/25	Drill operations begin at 0930 on 2/18/93. Change at 114' to a medium-coarse sand. 3.0" casing was advanced to 130' and not washed out. Drilling operations ended at 1625 for 2/18/93.	
120	S-23	120 - 122	0.0 ----- 2.0	BKG	No recovery	25/19/22/20		
125	S-24	125 - 127	0.3 ----- 2.0	BKG	Similar to S-22 with rounded medium gravel (SW)	25/32/28/38		
130	S-25	129	0.3 ----- 2.0	BKG	GRAVELY SAND, well graded, 10-20% fines, angular chunks of rock, gray, wet (SW-GW)	32/120 for 3 inches		
135					Bedrock appears to have been encountered at 129.6' (120 blows for 0.1')		Drill operations begin at 10:00 on 2/19/93. 3" casing was pulled out of the hole. Will begin advancing 6.25" auger 2/22/93	
140								
145								
150								

SOIL BORING LOG					Study Area: Cold Spring Brook		
Client: AEC		Project No. 7005-04			Boring No.: CSM-93-02B		
Contractor: New Hampshire Boring		Date Started: 02/24/93			Completed: 02/25/93		Method: HSA
Ground Elev.: 262.4		Soil Drilled: 68' bgs			Total Depth: 68 ft.		Casing Size: 6.25"
Logged by: M. Daniels		Checked by: RRR			Groundwater Below Ground: 23 ft.		
Screen: 10 (ft)		Riser: 60 (ft)		Diam.: 4.0" (ID)	Material: Sch 40PVC	Protection: Mod.D	Page 1 of 1
DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PEN. — REC.	PID (ppm)	SOIL-ROCK DESCRIPTION	BLOWS\6-IN.	COMMENTS
10					No soil samples collected. See CSM 93-02A for soil descriptions, this is a monitoring well installation.		
20							
30							
40							
50							
60					BOB at 68' bgs Screen 67-57 Sand to 50 Bent. Slurry 48-28 Grout 28-surface Note: sand (from formation) appears to have squeezed in at base of slurry (48-50)		
70							
80							
90							
100							
110							
120							
130							
140							
150							

SEDIMENT CORE LOG

Study Area: Plow Shop Pond

Site ID: SHD-92-01X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/3/92 Completed: 12/3/92

PI Meter: Photovac TIP

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 8.5 ft.

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.0-0.7		BKG	HIGHLY ORGANIC SEDIMENT, 100% organics, 90% decomposed, black, loose, saturated, 3" diameter chunk of root, lacustrine	PT
1					
2	1.8-2.2		BKG	HIGHLY ORGANIC SEDIMENT, same as above	PT
		4.6 ----- 8.5			
3	2.7-3.2		BKG	4" 50% sediment (organic), 50% fine sand, sharp contact SAND, fine to coarse, grained, well graded, loose, saturated, 7.5 yr 4/2	PT SW
4					
	4.0-4.6		BKG	SAND, similar to above	
5					
				BOE = 8.5 (Refusal)* *Tube 9.5'	

ABB Environmental Services, Inc.

SEDIMENT CORE LOG					Study Area: Plow Shop Pond	
					Site ID: SHD-92-02X	
Client: AEC			Project No.: 07005-04		Protection: Modified D	
Contractor: Rossfelder, Corp.			Date Started: 12/1/92 Completed: 12/1/92		PI Meter: Photovac TIP	
Method: Vibracore			Core Tube Diameter: 4.0"		Total Depth: 4.5 ft.	
Logged by: LEF			Checked by: RRR		Page 1 of 1	
DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS	
1	0.0-0.5		BKG	HIGHLY ORGANIC SOILS, 100% organics, including whole leaves and roots, soft, very saturated (muck), dark brown, lacustrine	PT	
2			BKG	HIGHLY ORGANIC SOILS, 90% organics, mostly decomposed to extremely fine-grained material with some wood and roots, soft, moist, dark brown, somewhat reddish, lacustrine	PT	
3	2.2-2.7	4.5 ----- 5.0				
4			BKG	HIGHLY ORGANIC SOILS, similar to above, however, contains 0-2% fine-grained sand and stiffer	PT	
5	4.0-4.5					
				BOE = 5'		

SEDIMENT CORE LOG

Study Area: Plow Shop Pond

Site ID: SHD-92-03X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/4/92 Completed: 12/4/92

PI Meter: TE 3 PID

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 2.5 ft.

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
1	0.0-0.5		BKG	HIGHLY ORGANIC SEDIMENTS, 100% organics, 40% non-decomposed roots, twigs, and grass, loose, saturated, black, lacustrine	PT
2	1.9-2.5		BKG	2.3'-2.5' SAND, fine to coarse, gray, well graded	SW
3				Recovery = 2.5'	
4					
5				BOE = 5'	

ABB Environmental Services, Inc.

SEDIMENT CORE LOG				Study Area: Plow Shop Pond	
				Site ID: SHD-92-04X	
Client: AEC		Project No.: 07005-04		Protection: Modified D	
Contractor: Rossfelder, Corp.		Date Started: 12/3/92 Completed: 12/3/92		PI Meter: Photovac TIP	
Method: Vibracore		Core Tube Diameter: 4.0"		Total Depth: 2.5-3 to Refusal/1.5 in core	
Logged by: LEF		Checked by: RRR		Page 1 of 1	
DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.0-0.5				
1	0.5-1.5		BKG	HIGHLY ORGANIC SEDIMENT, 100% organic matter, black, completely saturated, odorous, loose, lacustrine	PT
		1.5 ----- 2.5		Recovery = 1.5'	
2					
				Refusal = 2.5'	
3					
4					
5					
NOTE: Not enough sample left after analysis jars filled for jar head-space.					

SEDIMENT CORE LOG

Study Area: Plow Shop Pond

Site ID: SHD-92-05X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/1/92 Completed: 12/1/92

PI Meter: Photovac TIP

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 5 ft.

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.0-0.5		BKG	HIGHLY ORGANIC SOILS, 100% organics including grass and roots, no leaves, very saturated (muck), dark brown, soft, lacustrine	PT
1					
2					
	2.0-2.5		BKG	HIGHLY ORGANIC SOILS, 100% organics, 50% roots and grass, firm, saturated, dark brown, lacustrine	PT
3		4.0 ----- 5.0			
	3.5-4.0		BKG	HIGHLY ORGANIC SOILS, 100% organics, 5-10% roots and grass, loose, saturated, black, lacustrine	PT
4				Recovery = 4'	
5				BOE = 5'	

ABB Environmental Services, Inc.

SEDIMENT CORE LOG					Study Area: Plow Shop Pond	
					Site ID: SHD-92-06X	
Client: AEC			Project No.: 07005-04		Protection: Modified D	
Contractor: Rossfelder, Corp.			Date Started: 12/1/92 Completed: 12/1/92		PI Meter: Photovac TIP	
Method: Vibracore			Core Tube Diameter: 4.0"		Total Depth: 5 ft.	
Logged by: LEF			Checked by: RRR		Page 1 of 1	
DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS	
1	0.0-0.5		BKG	HIGHLY ORGANIC SOILS, 100% organics, roots and grass, very saturated, (muck), dark brown, soft, lacustrine	PT	
2						
3	2.5-3.0		BKG	HIGHLY ORGANIC SOILS, same as above except stiffer, 100% organic roots, still intact	PT	
		5.0 ----- 5.0				
4						
5	4.5-5.0		BKG	HIGHLY ORGANIC SOILS, same as above	PT	
				BOE = 5'		

SEDIMENT CORE LOG

Study Area: Plow Shop Pond

Site ID: SHD-92-07X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/1/92 Completed: 12/1/92

PI Meter: Photovac TIP

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 3 ft.

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.0-0.5		BKG	HIGHLY ORGANIC MATTER, 100% organics, 80% roots and twigs and grass, very tight, saturated, almost black, soft, lacustrine	PT
1					
2					
	2.5-3.0		BKG	HIGHLY ORGANIC MATTER, 100% organics, 15% roots and grass, all other is decomposed, loose, saturated (muck), soft, lacustrine	PT
3		3.0		Recovery = 3'	
		5.0			
4					
5				BOE = 5'	

ABB Environmental Services, Inc.

SEDIMENT CORE LOG				Study Area: Plow Shop Pond	
				Site ID: SHD-92-08X	
Client: AEC		Project No.: 07005-04		Protection: Modified D	
Contractor: Rossfelder, Corp.		Date Started: 12/4/92 Completed: 12/4/92		PI Meter: TE 3 PID	
Method: Vibracore		Core Tube Diameter: 4.0"		Total Depth: 7 ft.	
Logged by: LEF		Checked by: RRR		Page 1 of 1	
DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.0-1.0		BKG	HIGHLY ORGANIC SEDIMENT, 100% organics, 80% not decomposed, mostly rotting grass, black, greenish parts, soft, lacustrine	PT
1					
2					
3					
	3.5-4.0		BKG	HIGHLY ORGANIC SEDIMENT, 100% organics, 50-70% decomposed, grass and roots, well preserved, soft, black, lacustrine	PT
4					
5		7.0 ----- 9.5			
6					
	6.5-7.0		BKG	HIGHLY ORGANIC SEDIMENT, same as above	PT
7					
8				Recovery = 7'	
9					
10				BOE = 9.5'	
11					

SEDIMENT CORE LOG

Study Area: Plow Shop Pond

Site ID: SHD-92-09X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/3/92 Completed: 12/3/92

PI Meter: Photovac T/P

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 5' recovered

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
1	0.0-0.5		BKG	HIGHLY ORGANIC SEDIMENT, 100% organics, 30% non-decomposed, dark-dark brown, soft (at 00), little firmer below well-preserved roots and some grass, saturated, lacustrine	PT
2					
3	2.5-3.0		BKG	HIGHLY ORGANIC SEDIMENT, same as above	PT
4					
5	4.5-5.0		BKG	HIGHLY ORGANIC SEDIMENT, same as above	PT
6		5.0		Recovery = 5'	
7		8.5			
8					
9				BOE = 8.5' Refusal = 9'	
10					
11					

SEDIMENT CORE LOG						Study Area: Plow Shop Pond	
						Site ID: SHD-92-10X	
Client: AEC			Project No.: 07005-04			Protection: Modified D	
Contractor: Rossfelder, Corp.			Date Started: 12/4/92 Completed: 12/4/92			PI Meter: TE 3 PID	
Method: Vibracore			Core Tube Diameter: 4.0"			Total Depth: 4.5 ft.	
Logged by: LEF			Checked by: RRR			Page 1 of 1	
DEPTH (FT)	SAMPLE DEPTH (FT)	REC. <hr/> PEN.	PID (PPM)	SEDIMENT DESCRIPTION		SOIL CLASS	
	0.0-0.5		BKG	HIGHLY ORGANIC SEDIMENT, 100% organics, mostly non-decomposed grass, very stringy, dark brown, loose, lacustrine		PT	
1							
2		4.5 ----- 5.0					
3	2.5-3.0		BKG	HIGHLY ORGANIC SEDIMENTS, 100% organics, 50% decomposed, roots, grass, loose, dark brown to black, lacustrine		PT	
4							
	4.0-4.5		BKG	HIGHLY ORGANIC SEDIMENTS, same as above			
				Recovery = 4.5'		PT	
5				BOE = 5'			

SEDIMENT CORE LOG

Study Area: Plow Shop Pond

Site ID: SHD-92-11X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/2/92 Completed: 12/2/92

PI Meter: TE 3 PID

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 5 ft.

Logged by: LEF

Checked by: RRR

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DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
0.0-0.5	1.0 ----- 5.0	BKG		<p>MOSTLY ORGANIC SEDIMENT, 100% organics, tight layer of biomass, 80% roots and grass, muck above and muck below with methane (couldn't sample below biomass), stiff to extremely loose (liquid), munsell 7.5 yr value 3/ chroma/2, lacustrine</p> <p>Recovery = 1'</p> <p>NOTE: When the sample was opened and homogenized for a composite sample, a bit of sheen was observed in the liquid muck</p> <p>COMMENT: This location was attempted several times. The composite sample was taken because recovery was poor. Tight biomass cannot be penetrated and the stuff below is not stiff enough to push the tight stuff through. Methane gas below.</p> <p>BOE = 5'</p>	PT

ABB Environmental Services, Inc.

SEDIMENT CORE LOG					Study Area: Plow Shop Pond	
					Site ID: SHD-92-12X	
Client: AEC			Project No.: 07005-04		Protection: Modified D	
Contractor: Rossfelder, Corp.			Date Started: 12/2/92 Completed: 12/2/92		PI Meter: TE 3 PID	
Method: Vibracore			Core Tube Diameter: 4.0"		Total Depth: 4.8 ft.	
Logged by: LEF			Checked by: RRR		Page 1 of 1	
DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION		SOIL CLASS
1	0.0-0.5	4.8 ----- 5.0	BKG	HIGHLY ORGANIC SEDIMENT, 100% organics, 70% roots, grass, twigs, 30% decomposed organics, loose, saturated, lacustrine, color 5 yr - 2.5/value-1/chroma		PT
2						
3	2.5-3.0		BKG	HIGHLY ORGANIC SEDIMENT, same as above		PT
4						
5	3.7-4.8	BKG	SAND, fine to medium sand, well graded, firm, gray and dark brown, splotched, mottled, 25-30% medium sand, 15-20% silt		SW	
		Recovery = 4.8'				
		BOE = 5'				

SEDIMENT CORE LOG

Study Area: Plow Shop Pond

Site ID: SHD-92-13X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/2/92 Completed: 12/2/92

PI Meter: TE 3 PID

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 5 ft.

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.0-0.5		BKG	HIGHLY ORGANIC SEDIMENTS, 100% organics, 30-50% roots and grass, loose (muck), saturated, lacustrine, some twigs and wood chunks, 2.5 yr 2.5/1	PT
1					
2		5.0 ----- 5.0			
	2.5-3.0		BKG	HIGHLY ORGANIC SEDIMENTS, same as above	PT
3					
4					
	4.5-5.0		BKG	HIGHLY ORGANIC SEDIMENTS, same as above except slightly less organic matter that is identifiable	PT
5				BOE = 5'	

ABB Environmental Services, Inc.

SEDIMENT CORE LOG

Study Area: Plow Shop Pond

Site ID: SHD-92-14X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/3/92 Completed: 12/3/92

PI Meter: TIP

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 5 ft.

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.0-0.5		BKG	HIGHLY ORGANIC SEDIMENT, 100% organics, mostly decomposed, some roots and twigs, very soft and wet (muck), 0-1.5' black, lacustrine	PT
1					
2		5.0 ----- 5.0			
3	2.5-3.0		BKG	HIGHLY ORGANIC SEDIMENT, 100% organics, 50% well-preserved roots and grass, (marsh-peat bog environment), firm, 5 yr 3/2, lacustrine	PT
4					
5	4.5-5.0		BKG	HIGHLY ORGANIC SEDIMENT, same as above	PT
				BOE = 5'	

ABB Environmental Services, Inc.

SEDIMENT CORE LOG

Study Area: Plow Shop Pond

Site ID: SHD-92-15X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/3/92 Completed: 12/3/92

PI Meter: TIP

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 5 ft.

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
0.0-0.7			BKG	HIGHLY ORGANIC SEDIMENT, 100% organic, mostly decomposed, some twigs and roots saturated, loose (muck), black, lacustrine	PT
2.5-3.0		4.7 ----- 5.0	BKG	HIGHLY ORGANIC SEDIMENT, 100% organic, 50% roots and grass, not decomposed, firm, saturated, lacustrine, marsh environment, 2.5 yr 2.5/2	PT
4.3-4.7			BKG	HIGHLY ORGANIC SEDIMENT, same as above	PT
				Recovery = 4.7'	
				BOE = 5'	

ABB Environmental Services, Inc.

Study Area: Plow Shop Pond

Site ID: SHD-92-16X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/3/92 Completed: 12/3/92

PI Meter: TIP

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 5'

Logged by: LEF

Checked by: RRR

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ABB Environmental Services, Inc.

SEDIMENT CORE LOG

Study Area: Plow Shop Pond

Site ID: SHD-92-17X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/3/92 Completed: 12/3/92

PI Meter: TIP

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 5 ft.

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.0-0.6		BKG	HIGHLY ORGANIC SEDIMENT, 100% organic material, 70% decomposed, loose, completely saturated (muck) lacustrine, dark brown	PT
1					
2					
		5.0 ----- 5.0			
	2.5-3.0		BKG	HIGHLY ORGANIC SEDIMENT, 100% organic material, 50% roots and grass, 50% decomposed, dark reddish brown, loose, saturated, lacustrine	PT
3					
4					
	4.5-5.0		BKG	HIGHLY ORGANIC SEDIMENT, same as above	PT
5				BOE = 5'	

ABB Environmental Services, Inc.

SEDIMENT CORE LOG

Study Area: Plow Shop Pond

Site ID: SHD-92-18X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/3/92 Completed: 12/3/92

PI Meter: TIP

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 5 ft.

Logged by: LEF

Checked by: RRR

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DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.0-0.8		BKG	HIGHLY ORGANIC SEDIMENT, 100% organics, mostly (80%) decomposed, 20% grass roots, twigs, loose, saturated, muck, 2.5 yr 25/0, lacustrine	PT
1					
2					
3	2.5-3.1		BKG	HIGHLY ORGANIC SEDIMENT, 100% organics, 40% biomass not decomposed including long pieces of grass and roots, firm-loose, saturated, 2.5 yr 25/0 lacustrine, texture is constant, however, the coloring shows layers of dark-dark brown and dark gray brown (2.5'-3.5')	PT
4					
5	4.3-5.0		BKG	HIGHLY ORGANIC SEDIMENTS, same as above SAND 60%, fine to medium, gray ORGANICS 40%, same as above	PT PT/SW
				BOE = 5'	

ABB Environmental Services, Inc.

*****ADD ENVIRONMENTAL SERVICES, INC.*****

SEDIMENT CORE LOG

Study Area: Plow Shop Pond

Site ID: SHD-92-19X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/2/92 Completed: 12/2/92

PI Meter: TE 3 PID

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 2 ft. (core 5')

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
0.0-0.5			BKG	HIGHLY ORGANIC SEDIMENT, 80% organics, loose, completely saturated, well graded, dark brown, lacustrine	PT
1		2.0 ----- 5.0			
1.5-2.0			BKG	FILL, well graded, gravel, fish-line, glass, all colors	GW
2				Recovery = 2'	
3					
4					
5				BOE = 5'	
				NOTE: Two unsuccessful attempts due to refusal. The sediment in the drive shoe has extremely well-graded gravel with glass in it.	

SEDIMENT CORE LOG					Study Area: Plow Shop Pond	
					Site ID: SHD-92-20X	
Client: AEC			Project No.: 07005-04		Protection: Modified D	
Contractor: Rossfelder, Corp.			Date Started: 12/2/92 Completed: 12/2/92		PI Meter: TE 3 PID	
Method: Vibracore			Core Tube Diameter: 4.0"		Total Depth: 5 ft.	
Logged by: LEF			Checked by: RRR		Page 1 of 1	
DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS	
1	0.0-0.8		BKG	HIGHLY ORGANIC SEDIMENTS, 100% organics, 15% roots and twigs, mostly decomposed, organic muck, color 5 yr 2.5/1, saturated, lacustrine	PT	
2		5.0				
		5.0				
3	2.3-3.1		BKG	HIGHLY ORGANIC SEDIMENTS, same as above except more decomposed		
4				Interbedded layers of well graded sand		
5	4.2-5.0		BKG	HIGHLY ORGANIC SEDIMENTS, 20% sand in layers, fine to medium, well graded, 80% organics including roots, twigs, peat-like deposits, black, swampy origin	SW-PT	
				BOE = 5'		

SEDIMENT CORE LOG

Study Area: Plow Shop Pond

Site ID: SHD-92-21X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/4/92 Completed: 12/4/92

PI Meter: TE 3 PID

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 7 ft.

Logged by: LEF

Checked by: RRR

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DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
1	0.0-1.0		BKG	HIGHLY ORGANIC SEDIMENT, 100% organics, 20% fresh (recently alive) biomass, 50% decomposed, loose, black, saturated, lacustrine	PT
2					
3					
4	3.5-4.0		BKG	HIGHLY ORGANIC SEDIMENT, 100% organics, roots, grass, leaves, well preserved wood chunks, dark brown, loose, saturated, lacustrine	PT
5		7.0 ----- 9.5			
6					
7	6.0-7.0		BKG	HIGHLY ORGANIC SEDIMENT, same as above	PT
8				Recovery = 7'	
9					
10				BOE = 9.5'	
11					

ABB Environmental Services, Inc.

SEDIMENT CORE LOG					Study Area: Plow Shop Pond	
					Site ID: SHD-92-22X	
Client: AEC			Project No.: 07005-04		Protection: Modified D	
Contractor: Rossfelder, Corp.			Date Started: 12/2/92 Completed: 12/2/92		PI Meter: TE 3 PID	
Method: Vibracore			Core Tube Diameter: 4.0"		Total Depth: 2.8 ft.	
Logged by: LEF			Checked by: RRR		Page 1 of 1	
DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS	
1	0.0-0.8	2.8 ----- 5.0	BKG	HIGHLY ORGANIC SEDIMENT, 100% organic material including sticks and roots, loose, saturated, dark brown, lacustrine	PT	
2						
	2.1-2.8		BKG	HIGHLY ORGANIC SEDIMENT, same as above except with a 10% fine to medium sand component	PT	
3				Recovery = 2.8'		
4						
5				BOE = 5'		

SEDIMENT CORE LOG

Study Area: Plow Shop Pond

Site ID: SHD-92-23X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/2/92 Completed: 12/2/92

PI Meter: TE 3 PID

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 5 ft.

Logged by: LEF

Checked by: RRR

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DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
0.0-0.5			BKG	HIGHLY ORGANIC SEDIMENT, 100% organics including roots, grass, twigs, and wood, loose, saturated, dark brown, lacustrine	PT
1					
2					
2.5-3.0			BKG	HIGHLY ORGANIC SEDIMENT, 100% organics, mostly non-decayed, firm, saturated, dark brown, lacustrine	PT
3		5.0			
		5.0			
4					
4.5-5.0			BKG	HIGHLY ORGANIC SEDIMENT, same as above, shows little increase in decay with depth	PT
5				BOE = 5'	

ABB Environmental Services, Inc.

Study Area: Plow Shop Pond

Site ID: SHD-92-24X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/2/92 Completed: 12/2/92

PI Meter: TE 3 PID

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 5 ft.

Logged by: LEF

Checked by: RRR

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DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.0-0.5		BKG	HIGHLY ORGANIC SEDIMENT, 100% organic material including twigs and roots, loose, completely saturated, dark brown, lacustrine	PT
1					
2					
3	2.7-3.2		BKG	HIGHLY ORGANIC SEDIMENT, 90% organic matter, biomass still non-decayed 30%, 10% or less fine sand and silt, loose, grading to firm, saturated, dark brown, lacustrine	PT
		5.0			
		5.0			
4					
	4.5-5.0		BKG	HIGHLY ORGANIC SEDIMENT, 85% organics, 15% fine sand, some medium sand, otherwise same as above	PT
5				BOE = 5'	

ABB Environmental Services, Inc.

***** ABB ENVIRONMENTAL SERVICES, INC. *****

SEDIMENT CORE LOG

Study Area: Plow Shop Pond

Site ID: SHD-92-25X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/3/92 Completed: 12/3/92

PI Meter: Photovac TIP

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 5 ft.

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
1	0.0-0.8		BKG	HIGHLY ORGANIC SEDIMENTS, 100% organics, roots, twigs, stiff, saturated, 10 yr 2/1, lacustrine	PT
2		5.0 ----- 5.0		2.5' SAND, medium to fine, 1" thick	
3	2.5-3.5		BKG	HIGHLY ORGANIC SEDIMENTS, 90% organics, 10% sand, stiff, roots and twigs not decomposed entirely, saturated, 10 yr 2/1, lacustrine	PT
4					
5	4.5-5.0		BKG	HIGHLY ORGANIC SEDIMENTS, 100% organics, well-preserved, stiff, dryer than above, moist, 10 yr 2/1, peat-bog origin	PT
				BOE = 5'	
				COMMENTS: Two times they cored and thought tube was empty, tapped-out sediments with vibrating head and re-cored. The tube sampled was the third try.	

SEDIMENT CORE LOG				Study Area: Cold Spring Brook Pond	
				Site ID: CSD-92-01X	
Client: AEC		Project No.: 07005-04		Protection: Modified D	
Contractor: Rossfelder, Corp.		Date Started: 12/5/92 Completed: 12/5/92		PI Meter: TE(3)PID	
Method: Vibracore		Core Tube Diameter: 4.0"		Total Depth: 4 ft.	
Logged by: LEF		Checked by: RRR		Page 1 of 1	
DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
1	0.0-0.5		BKG	0'-1' highly organic sediments, black, silty, roots and leaves	PT
				1'-3' silty sand, fine to medium, 10% silt, moderately rounded, wet, 7.5 yr, 5% gravel, 0.1' thick, silt layer at 1.5'	SW
2	1.7-2.2	3.0 ----- 4.0	BKG		
3	2.5-3.0		BKG		
				Recovery = 3'	
4					
				BOE 4 ft.	
5					

SEDIMENT CORE LOG

Study Area: Cold Spring Brook Pond

Site ID: CSD-92-02X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/5/92 Completed: 12/5/92

PI Meter: TE 3 PID

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 4' recovery, 5' boring length

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.0-0.5		BKG	0'-0.8' HIGHLY ORGANIC SEDIMENT, 100% organics including leaves and twigs, black, saturated, muck, lacustrine	PT
1				1.2' SANDY SILT right below organics, light brown, firm, saturated	SM
				1.2'-4.0' SAND, fine to medium sand, 10% silt, subangular, glacial outwash, saturated, firm	SP
2	1.7-2.2		BKG		
3		4.0 ----- 5.0			
4	3.5-4.0		BKG		
				Recovery = 4'	
5				BOE = 5'	

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Site ID: CSD-92-03X

Protection: Modified D

PI Meter: TE 3 PID

Total Depth: 5

Page 1 of 1

ABB Environmental Services, Inc.

SEDIMENT CORE LOG

Study Area: Cold Spring Brook Pond

Site ID: CSD-93-04X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/5/92 Completed: 12/5/92

PI Meter: TE 3 PID

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 4.5'

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.0-0.5		BKG	ORGANICS and SAND, 30% black soft organics, 70% poorly sorted sand, fine to medium, glacial outwash, 2.5 yr 6/2, getting firmer with depth	SP-SM (some PT)
1					
2					
	2.5-3.0	4.5 ----- 5.0	BKG	SAND, same as above, liesgang banding at 2.5', 0.2' thick layer with some gravel at top of silt SILT, sandy silt, 25% fine sand, plastic, 2.5 yr 6/2 lacustrine, stiff, saturated	SP-SM SM
3					
4	4.0-4.5		BKG		
				Recovery = 4.5'	
5				BOE = 5'	

Study Area: Cold Spring Brook Pond

Site ID: CSD-92-05X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/5/92 Completed: 12/5/92

PI Meter: TE 3 PID

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 4 ft.

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.0-0.5		BKG	ORGANIC SAND, 50% organics, muck, black, 50% sand, 10 yr 5/2, poorly sorted, organics not decomposed, soft, lacustrine	PT/SM
1					
				SANDY PEAT, 50% organics, 5 yr 4/4, well-preserved wood chunks and roots, 50% poorly sorted, fine to medium sand, firm, lacustrine	PT/SM
2					
	2.0-2.5		BKG	FINE SILTY SAND, 10 yr 5/2, 15% silt, fine to medium, moistly fine sand, glacial outwash, saturated, firm	SP
		4.0 ----- 5.0			
3				Some liesgang banding at 3'	
	3.5-4.0		BKG		
4				Recovery = 4'	
5				BOE = 5'	

SEDIMENT CORE LOG

Study Area: Cold Spring Brook Pond

Site ID: CSD-92-06X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/5/92 Completed: 12/5/92

PI Meter: TE 3 PID

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 4 ft.

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.0-0.5		BKG	ORGANIC SAND, 40% organic roots, leaves, grass, loose, 10 yr 3/2, fine to medium sand, saturated, lacustrine	PT/SM/SP
1					
2	1.8-2.2		BKG	SAND, layered, silty fine to coarse sand, well graded, 20% silt, no organics, glacial outwash, saturated, stiff, 10 yr 5/1	SM
3				SANDY SILT, saturated but acts dry, very stiff, 2.5 yr 5/4, band at 2.8', 1/4" thick, varves (sandy silt) glaciolacustrine, 10 yr 4/6	SM
4	3.5-4.0		BKG		
5				Recovery = 4'	
				BOE = 5'	

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SEDIMENT CORE LOG				Study Area: Cold Spring Brook Pond	
				Site ID: CSD-92-07X	
Client: AEC		Project No.: 07005-04		Protection: Modified D	
Contractor: Rossfelder, Corp.		Date Started: 12/7/92 Completed: 12/7/92		PI Meter: TE 3 PID	
Method: Vibracore		Core Tube Diameter: 4.0"		Total Depth: 1.5 ft.	
Logged by: LEF		Checked by: RRR		Page 1 of 1	
DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
1	0.0-0.5	1.5 ----- 3.0	BKG	HIGHLY ORGANIC SEDIMENT, 100% organics, roots, twigs, grass, black, loose, saturated, lacustrine	PT
	1.0-1.5		BKG	HIGHLY ORGANIC SEDIMENT, 50% decomposed, wood chunks, dark brown, moist, firm, lacustrine-marsh, roots and grass environment	PT
2					
3				BOE = 3'	
4					
5					
NOTE: Driven and retrieved by hand. Insufficient water depth for boat access.					

SEDIMENT CORE LOG

Study Area: Cold Spring Brook Pond

Site ID: CSD-92-08X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/7/92 Completed: 12/7/92

PI Meter: TE 3 PID

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 1.5 ft.

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.0-0.5		BKG	HIGHLY ORGANIC SEDIMENT, 100% organics, 30% not decomposed, roots, twigs, grass, loose, saturated, black lacustrine	PT
1	1.0-1.5	1.5 ----- 2.0	BKG	HIGHLY ORGANIC SEDIMENTS, same as above but stiffer and includes small rocks (2 or 3)	PT
2				BOE = 2'	
3					
4					
5					
NOTE: Driven via sledgehammer and retrieved by hand. Not enough water for boat access.					

ABB Environmental Services, Inc.

SEDIMENT CORE LOG

Study Area: Cold Spring Brook Pond

Site ID: CSD-92-09X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/5/92 Completed: 12/5/92

PI Meter: TE/OVA

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 5'

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.5-2.0		BKG	0-4.7 highly organic sediments, black extensive root matrix, peat type material	PT
1					
2					
	2.0-2.5				
		5.0			
3		5.0			
4					
			BKG	Stratified sand, poorly graded, fine, 0.05' thick, layered in sediments	
	4.5-5.0		BKG	4.7-5.0, sand poorly graded, fine to coarse, 5%-10% silt	SP-SM
5				BOE = 5'	

SEDIMENT CORE LOG

Study Area: Cold Spring Brook Pond

Site ID: CSD-92-10X

Client: AEC

Project No.: 07005-04

Protection: Modified D

Contractor: Rossfelder, Corp.

Date Started: 12/05/92 Completed: 12/05/92

PI Meter: TE/OVA

Method: Vibracore

Core Tube Diameter: 4.0"

Total Depth: 2.5

Logged by: LEF

Checked by: RRR

Page 1 of 1

DEPTH (FT)	SAMPLE DEPTH (FT)	REC. PEN.	PID (PPM)	SEDIMENT DESCRIPTION	SOIL CLASS
	0.0-0.5		BKG	0.0-0.5 highly organic sediments, extremely viscous, black, leaves twigs	SP-SM
1		2.5 ----- 2.5		0.5-2.5 SAND, poorly graded, medium, 30% fine, 5% silt, coarse gravel at 1.5-1.6 (single cobble) 10 yr 5/1	SP
2	2.0-2.5		BKG	Silty sand layer at 1.8-2.0, fine sand, 10 yr 5/1	
3				Refusal at 2.5'	
4					
5					

APPENDIX B
MONITORING WELL CONSTRUCTION FORMS

SHM-93-01A

SHM-93-10C

SHM-93-18B

SHM-93-22C

SHM-93-24A

CSM-93-01A

CSM-93-02A

CSM-93-02B

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WELL NO.: SHM-93-01A

DATE INSTALLED: 1/21/93

DRILLING METHOD: HSA

WATER ELEV.: 220.6

CASING ID: 6.25"

DATE: June 21, 1993

RIG GEOLOGIST: Rod Rustad

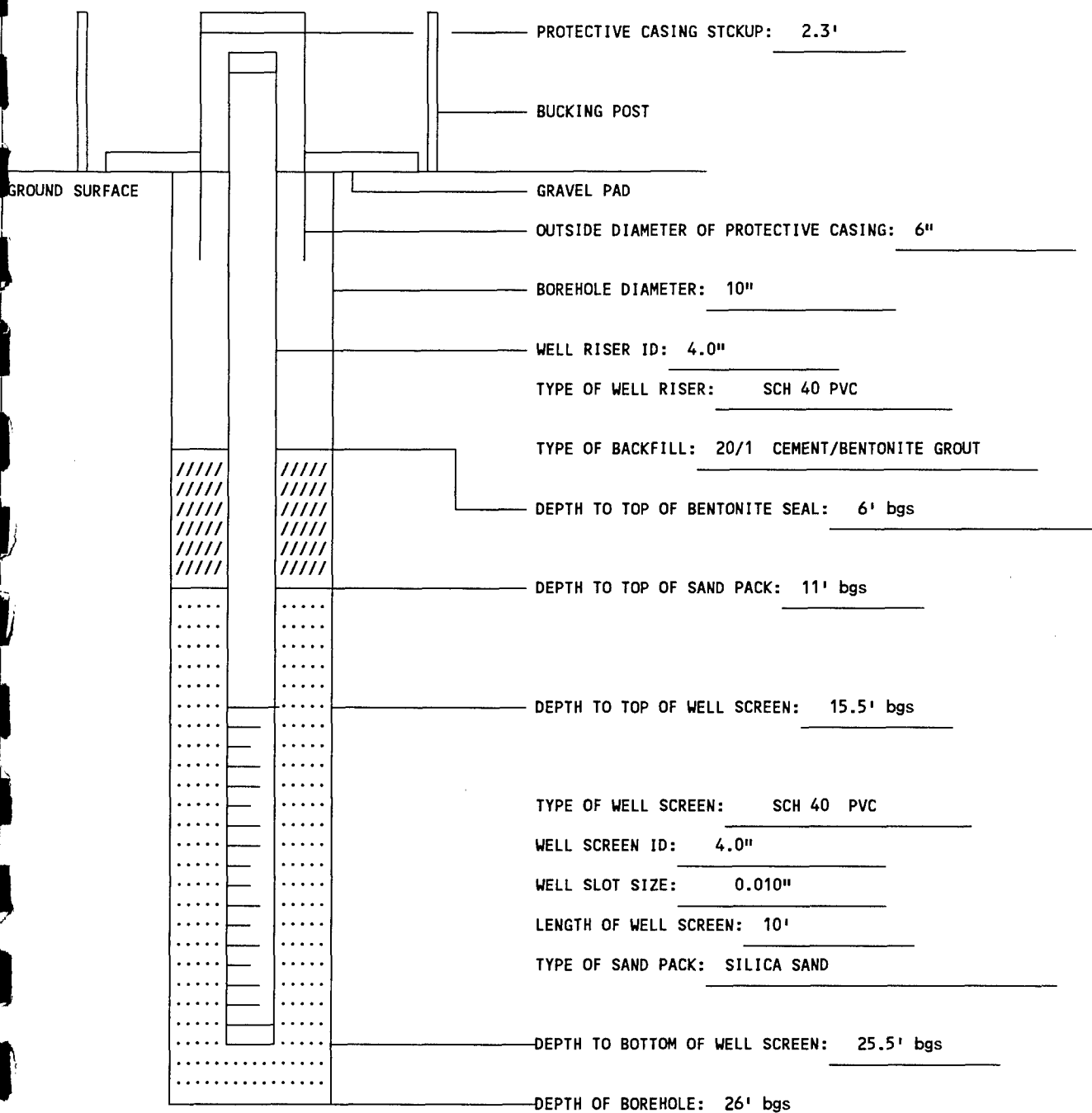


ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: SHM-93-10C

PROJECT NAME: Fort Devens FS/1A

DATE INSTALLED: 02/12/92

PROJECT NO.: 7005-04

DRILLING METHOD: Case/Core

WATER LEVEL: 218.32

GROUND ELEVATION: 247.1'

CASING ID: 6"/5 5/8" in rock

DATE: June 21, 1993

WELL CASING ELEVATION: 248.79'

RIG GEOLOGIST: Rod Rustad

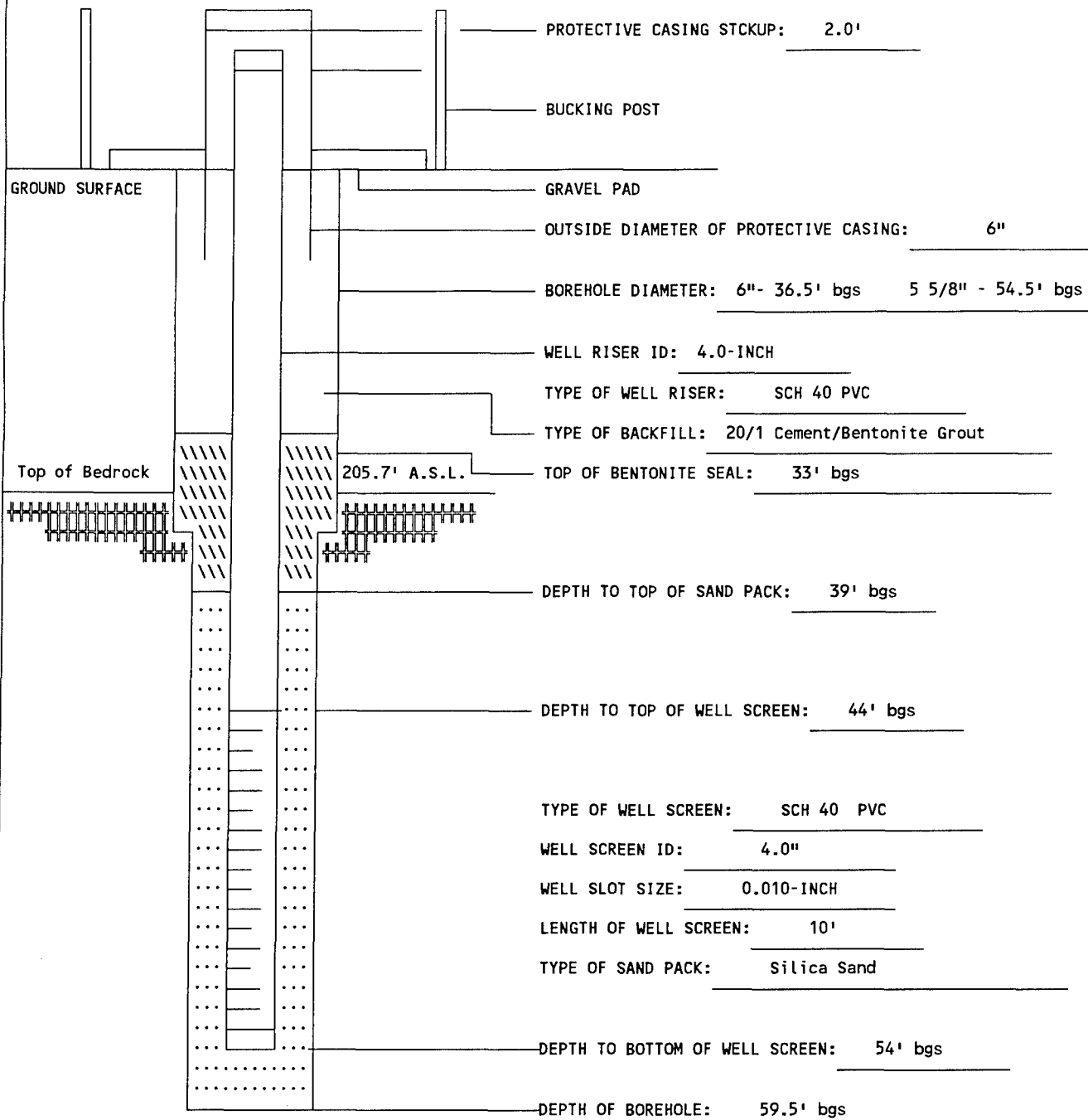


ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: SHM-93-18B

PROJECT NAME: FORT DEVENS 1A SITES

DATE INSTALLED: 2/10/93

PROJECT NO.: 7005-04

DRILLING METHOD: Drive/Wash HSA

WATER ELEV.: 218.79

GROUND ELEVATION: 236.2'

CASING ID: 3"/6.25"

DATE: June 21, 1993

WELL CASING ELEVATION: 238.38'

RIG GEOLOGIST: Nelson Bretton

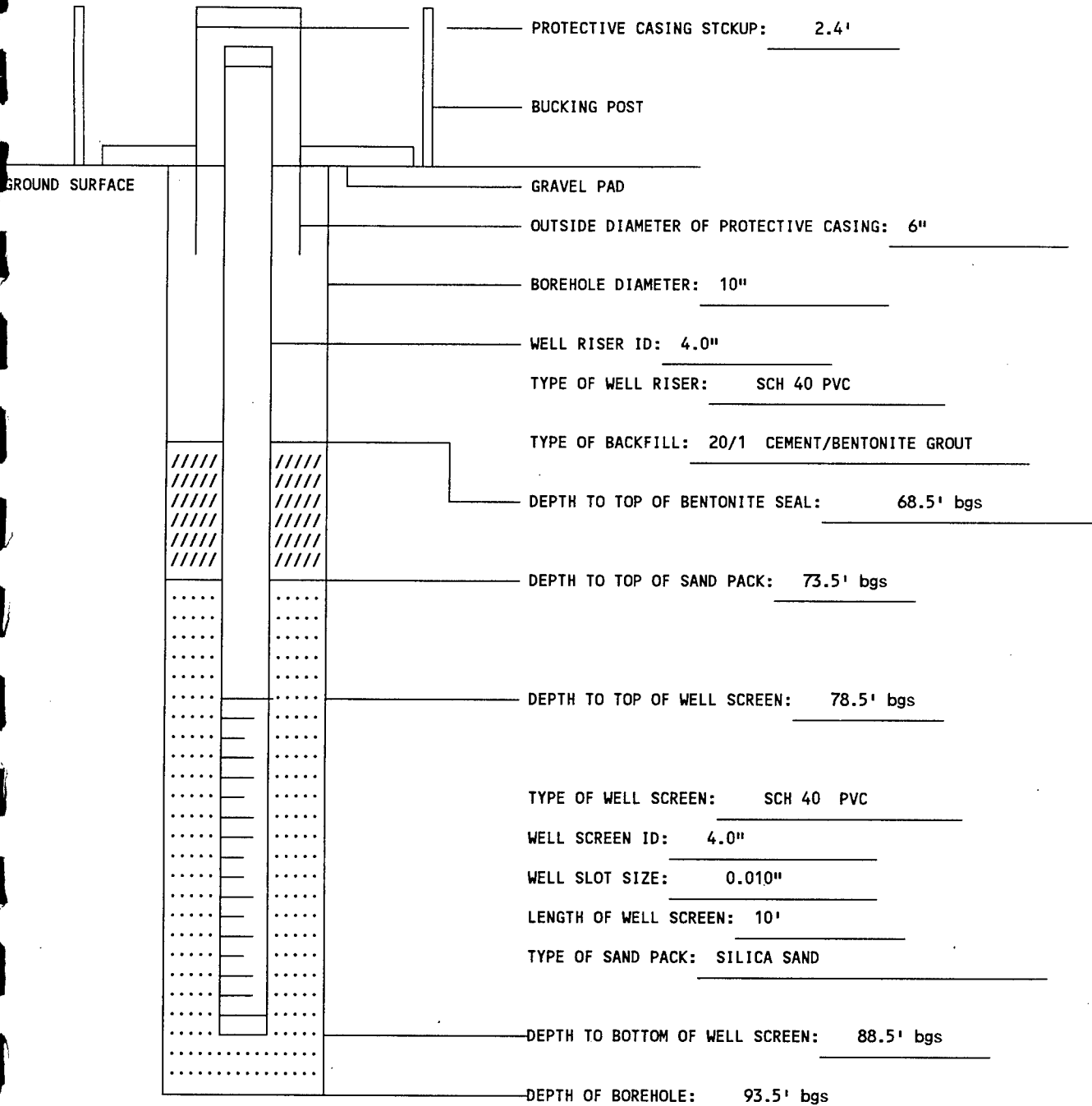


ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: SHM-93-22C

PROJECT NAME: Fort Devens FS/1A

DATE INSTALLED: 02/24/93

PROJECT NO.: 7005-04

DRILLING METHOD: Wash/Drive Casing

WATER LEVEL: 211.41

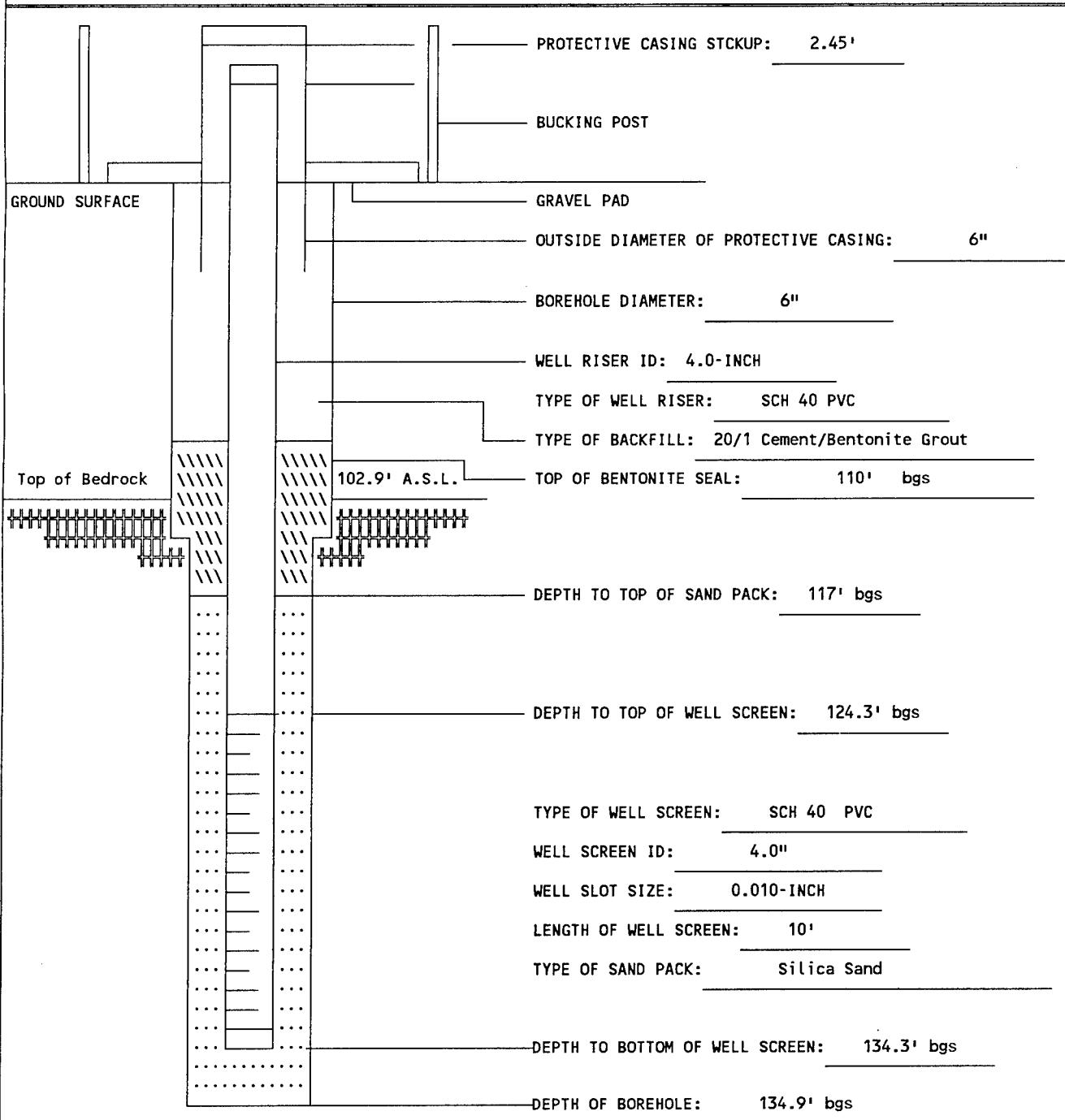
GROUND ELEVATION: 217.9'

CASING ID: 6"

DATE: June 21, 1993

WELL CASING ELEVATION: 219.76'

RIG GEOLOGIST: Lori Truesdale



WELL INSTALLATION DIAGRAM

WELL NO.: SHM-93-24A

PROJECT NAME: FORT DEVENS 1A SITES

DATE INSTALLED: 1/20/93

PROJECT NO.: 7005-04

DRILLING METHOD: HSA

WATER ELEV.: 220.49

GROUND ELEVATION: 235.5'

CASING ID: 6.25"

DATE: June 21, 1993

WELL CASING ELEVATION: 237.53'

RIG GEOLOGIST: Rod Rustad

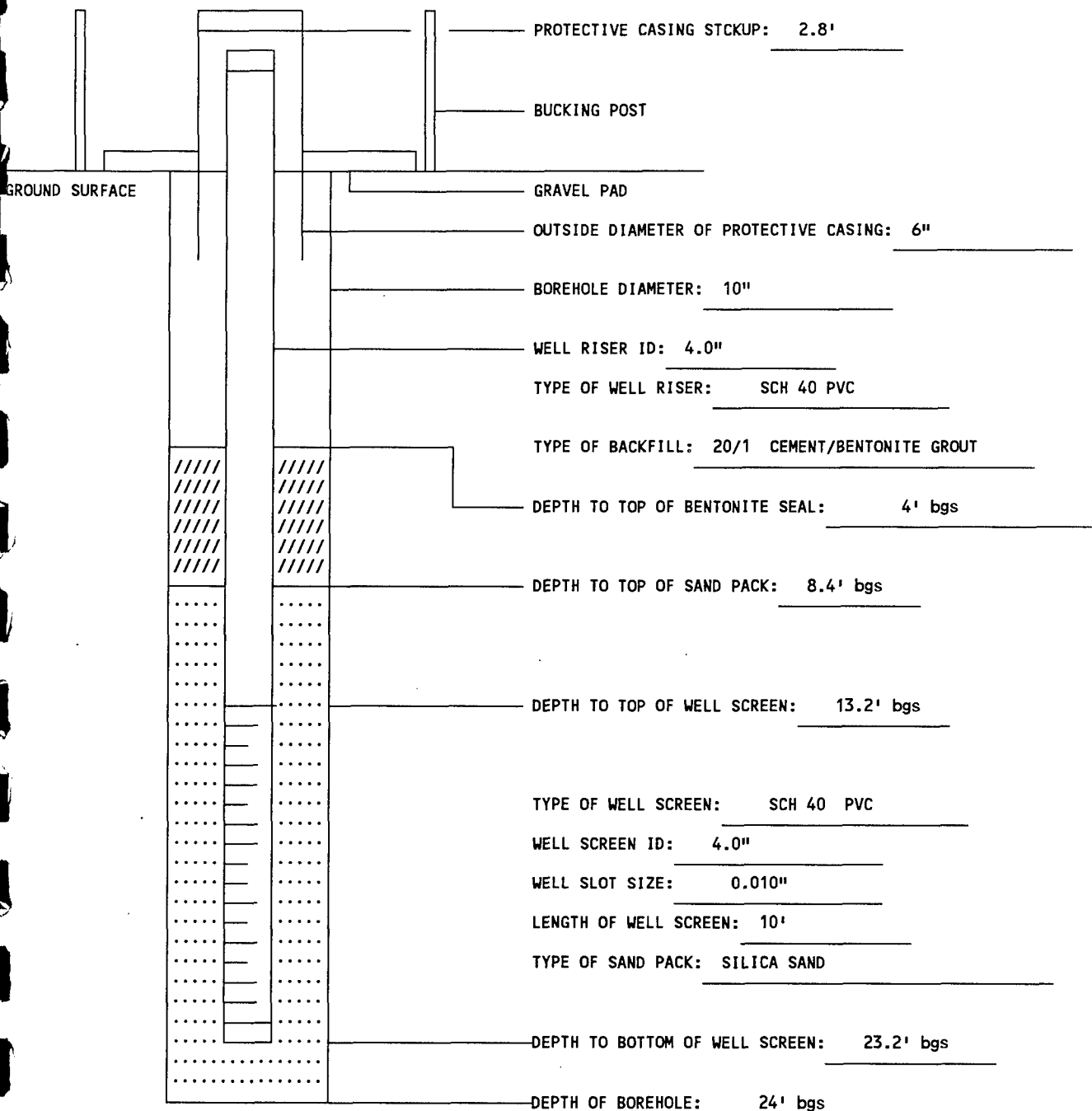


ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: CSM-93-01A

PROJECT NAME: FORT DEVENS 1A SITES

DATE INSTALLED: 02/03/93

PROJECT NO.: 7005-04

DRILLING METHOD: HSA/Drive/Wash

WATER ELEV.: 240.62

GROUND ELEVATION: 254.9'

CASING ID: 6"-39' bgs 5"-65.5' bgs

DATE: June 21, 1993

WELL CASING ELEVATION: 256.18'

RIG GEOLOGIST: Rod Rustad

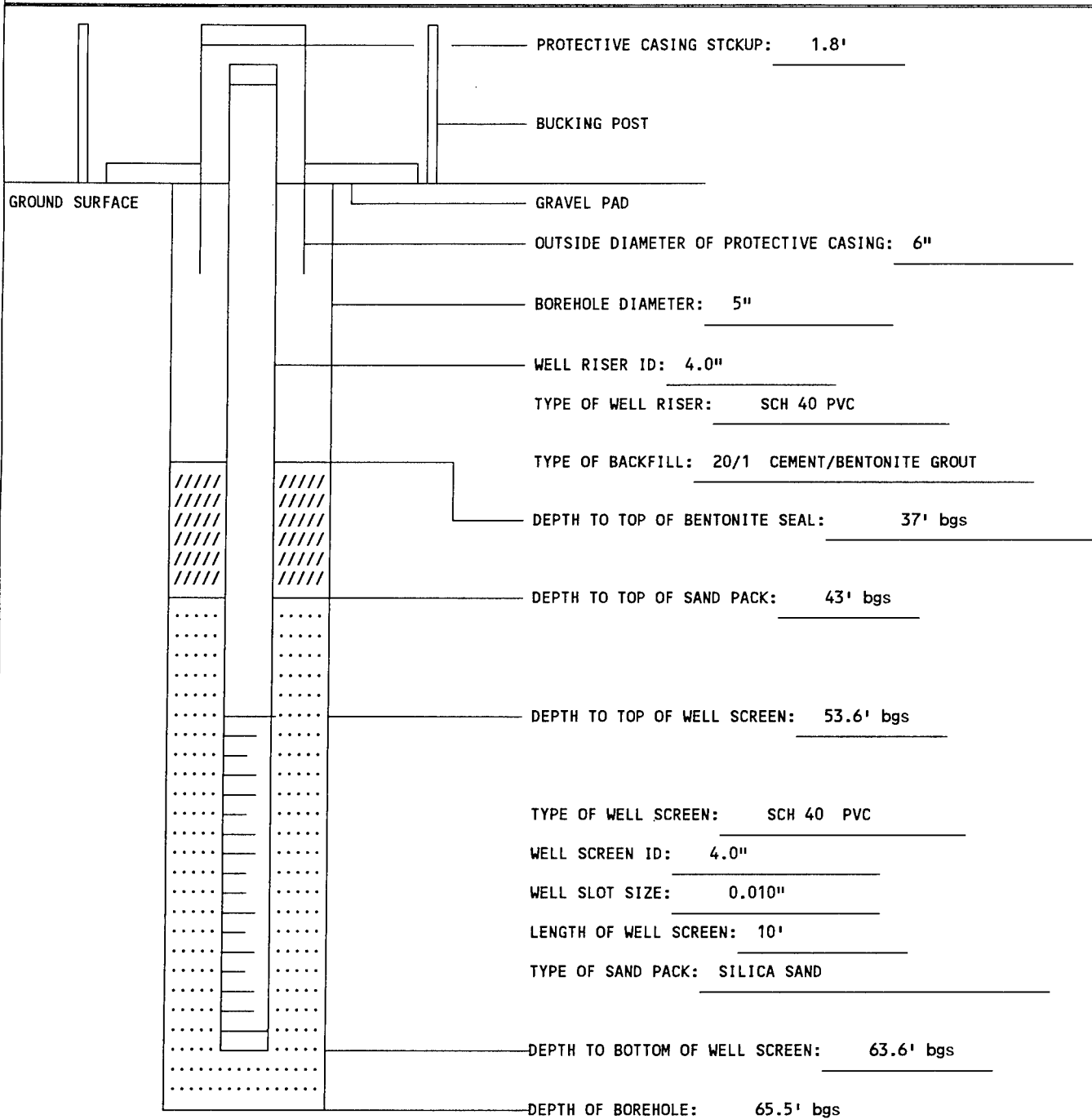


ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: CSM-93-02A

PROJECT NAME: FORT DEVENS 1A SITES

DATE INSTALLED: 03/08/93

PROJECT NO.: 7005-04

DRILLING METHOD: HSA

WATER ELEV.: 240.09

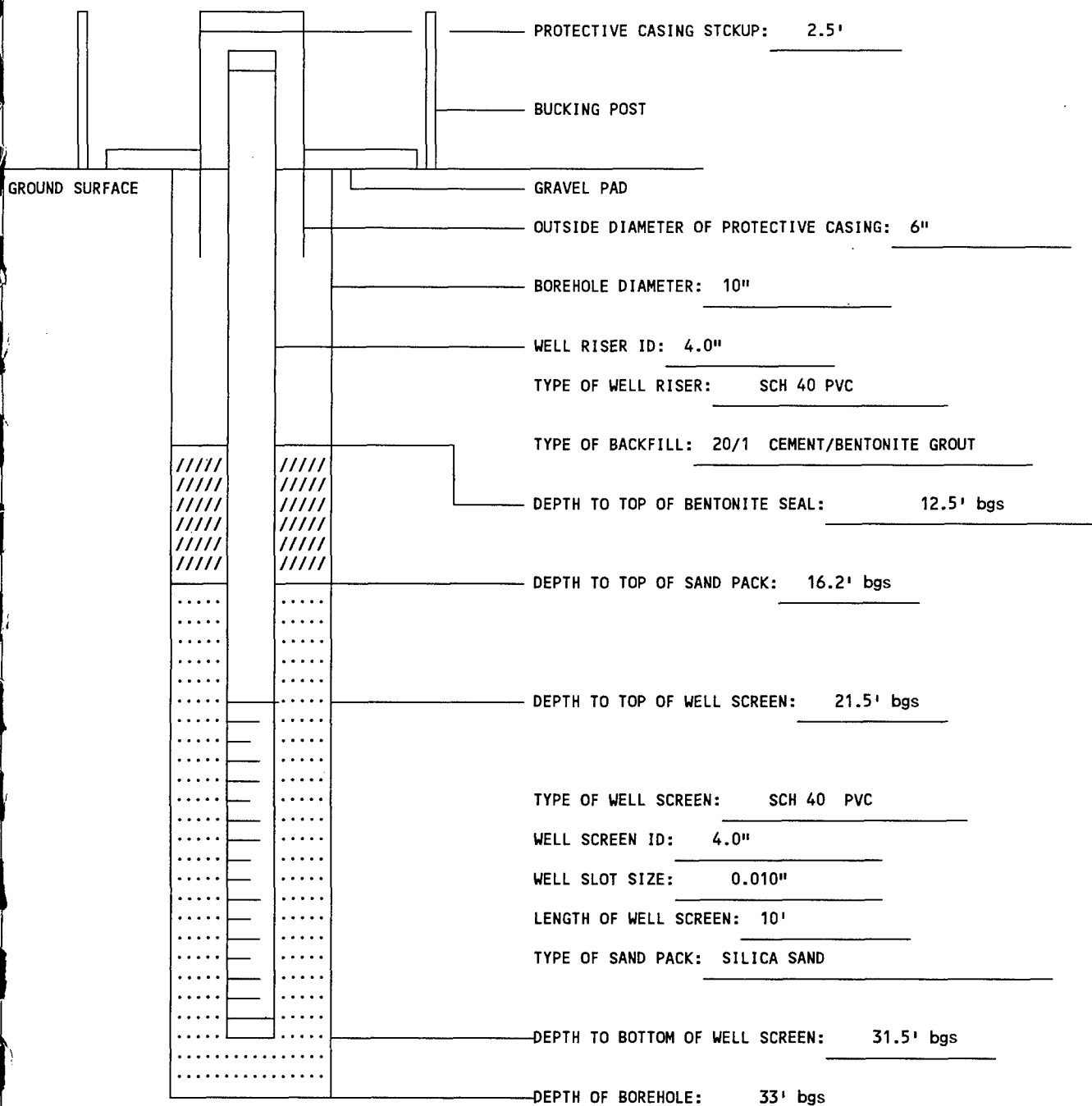
GROUND ELEVATION: 262.7'

CASING ID: 6.25"

DATE: June 21, 1993

WELL CASING ELEVATION: 264.82'

RIG GEOLOGIST: Geoff Knight



NOTE: Well originally installed on 02/23/93. Original well abandoned due to broken screen. Reinstalled on 03/08/93.

ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: CSM-93-02B

PROJECT NAME: FORT DEVENS 1A SITES

DATE INSTALLED: 02/25/93

PROJECT NO.: 7005-04

DRILLING METHOD: HSA w/ steel plug

WATER ELEV.: 240.1

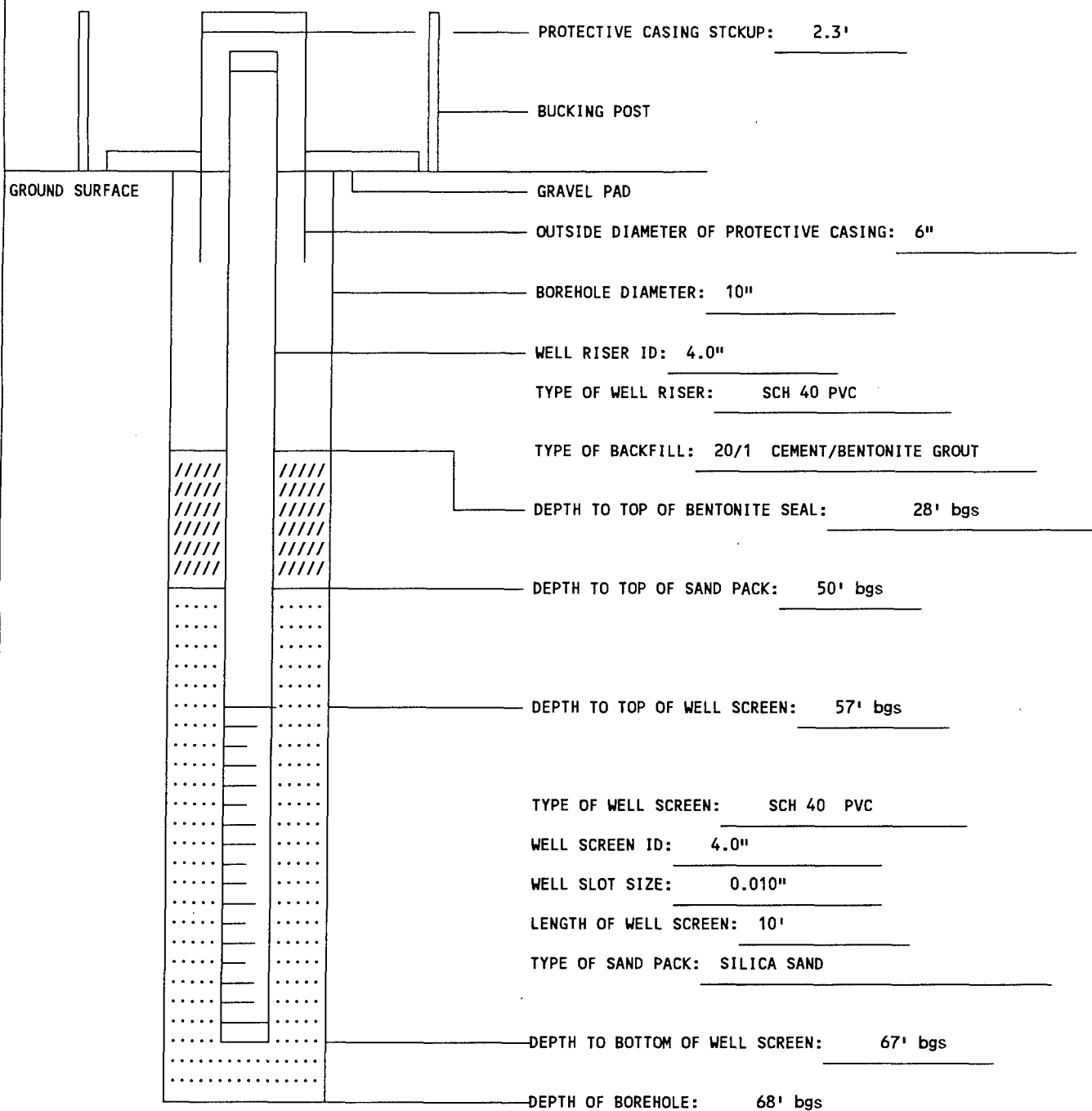
GROUND ELEVATION: 262.5'

CASING ID: 6.25"

DATE: June 21, 1993

WELL CASING ELEVATION: 264.09'

RIG GEOLOGIST: Matt Daniels



APPENDIX C
AQUIFER TESTING DATA AND CALCULATIONS

SHM-93-01A
SHM-93-10C
SHM-93-18B
SHM-93-22C
SHM-93-24A
CSM-93-01A
CSM-93-02A
CSM-93-02B

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APPENDIX C: HYDRAULIC CONDUCTIVITY TEST RESULTS

ABB-ES has performed a series of rising head slug tests on 8 monitoring wells installed during the Group 1A Supplemental Remedial Investigation. Two tests were performed at each well with water depressions ranging from 1.2 to 2.7 feet. Only one test was performed at SHM-93-22C because of exceptionally slow recovery. This appendix discusses the analytical procedure and presents estimated values of hydraulic conductivity. The test methodology is presented in Subsections 2.1.7 and 2.2.5, Aquifer Characterization and Testing. Field data from all tests were analyzed to estimate hydraulic conductivity using a derivation of the method of Hvorslev (1951)¹ and the method of Bouwer and Rice (1976)².

The form of the Hvorslev equation that was used relates the hydraulic conductivity, K, of an unconfined aquifer to the well geometry and the rate of head recovery by:

$$-K = \left[\frac{\text{Log}(H_1) - \text{Log}(H_2)}{t_1 - t_2} \right] \frac{r^2 \text{Log}(L/R)}{2L}$$

Parameters in this equation included: r (radius of the well casing), R (radius of the borehole), L (length of the aquifer tested), as well as time (t) and water level (H) data. Test data were also analyzed using AQTESOLV^{TM3}, an aquifer test

¹Hvorslev, M.J., 1951. "Time Lag and Soil Permeability in Groundwater Observations;" U.S. Army Corps of Engineers, Waterways Experiment Station, Bulletin 36; Vicksburg, Mississippi.

²Bouwer, H. and R.C. Rice, 1976. A Slug Test Method for Determining Hydraulic Conductivity of Unconfined Aquifers with Completely or Partially Penetrating Wells, Water Resources Research, Vol. 12, No. 3, pp 423-428.

³AQTESOLV, 1991 "AQTESOLV, Aquifer Test Solver Version 1.00;" Geraghty and Miller Modeling Group; Reston, VA.

APPENDIX C

analysis program by Geraghty Miller, Inc. AQTESOLV™ utilizes the Bouwer and Rice method for estimating hydraulic conductivities in unconfined aquifers.

Estimates of hydraulic conductivity for the 8 wells tested range between 4.0×10^{-2} cm/sec and 5.8×10^{-6} cm/sec for the Bouwer and Rice method while the Hvorslev method yields values of 1.6×10^{-2} cm/sec to 8.8×10^{-8} cm/sec. Typically the Bouwer and Rice method provided hydraulic conductivity values which were approximately twice the values obtained with the Hvorslev equation.

The results of hydraulic conductivity testing are provided in Table C-1. The data for each test are also provided. The first sheet is a semi-log plot of water level versus time with the range of values selected for analysis bracketed by circles. The second sheet presents the well geometry and raw data with the range of values selected for analysis underlined. The third sheet is the Field Data Sheet. Following the recovery plots, well geometry, raw data, and Field Data Sheets are the Hvorslev equations and the AQTESOLV™ plots.

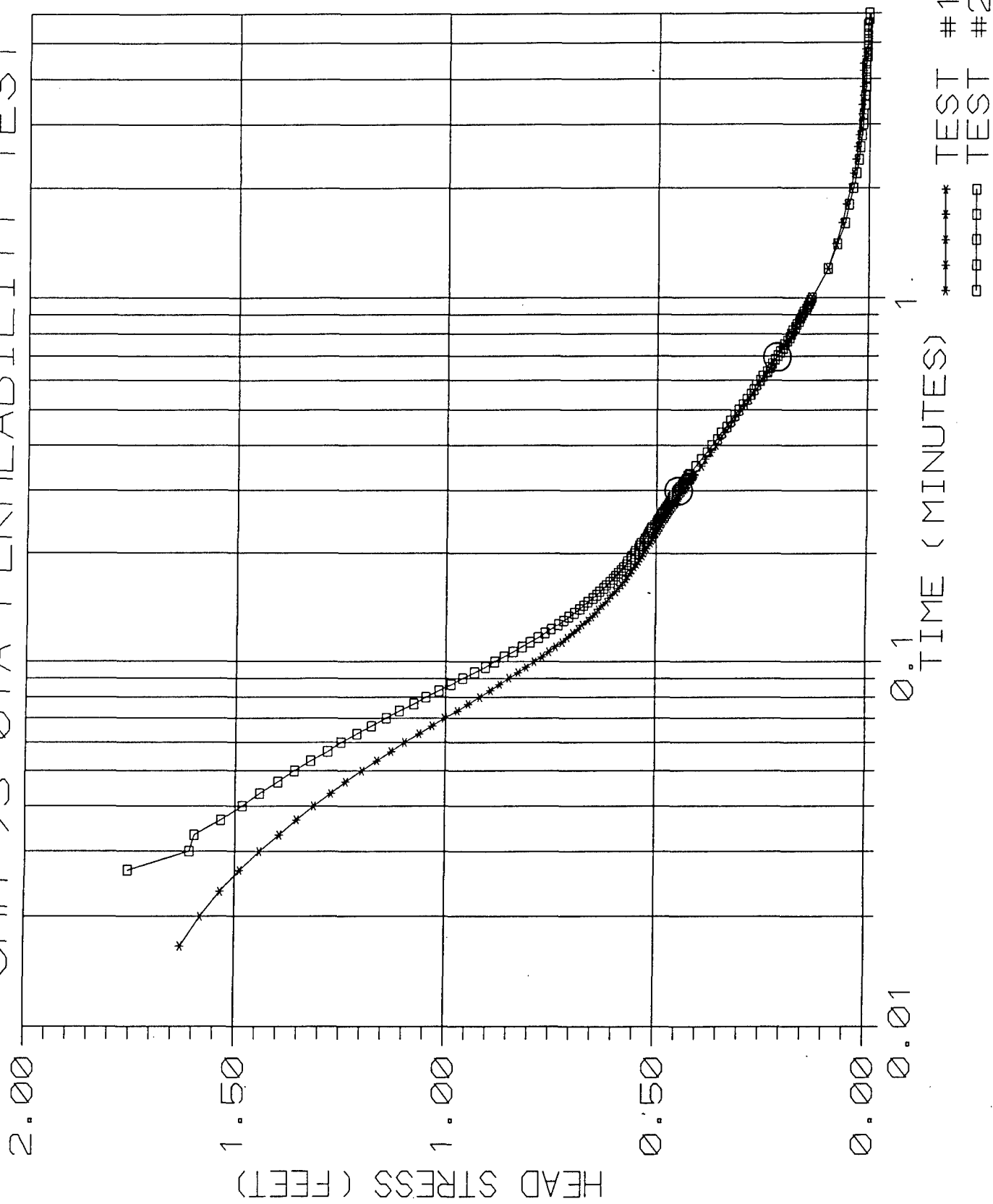
Hydraulic conductivity values are expressed in centimeters per second (cm/sec) while the raw data and recovery plots are referenced to feet and minutes. Static water levels in each well were referenced to zero with head stress being expressed as a positive change.

TABLE C-1
FIELD HYDRAULIC CONDUCTIVITY TEST RESULTS

REMEDIAL INVESTIGATION ADDENDUM REPORT
FEASIBILITY STUDY FOR GROUP 1A SITES
FORT DEVENS, MA

WELL	TEST NO.	TYPE OF WELL	HYDRAULIC CONDUCTIVITY	
			HVORSLEV (cm/sec)	BOUWER AND RICE (cm/sec)
SHM-93-01A	1	OVERBURDEN	1.3E-03	4E-03
	2		1.4E-03	9E-03
SHM-93-10C	1	ROCK	2.6E-05	2E-04
	2		3.1E-05	2E-04
SHM-93-18B	1	OVERBURDEN	5.4E-04	4E-03
	2		5.4E-04	4E-03
SHM-93-22C	1	ROCK	4.9E-07	6E-06
SHM-93-24A	1	OVERBURDEN	1.6E-02	2E-02
	2		1.6E-02	4E-02
CSM-93-01A	1	OVERBURDEN	4.6E-04	5E-04
	2		4.6E-04	7E-03
CSM-93-02A	1	OVERBURDEN	8.0E-04	2E-03
	2		8.4E-04	2E-03
CSM-93-02B	1	OVERBURDEN	2.8E-03	1E-02
	2		2.6E-03	1E-02

SHM-93-01A PERMEABILITY TEST



SHM-93-01A

WELL RADIUS= 0.167 FT, SATURATED SCREEN LENGTH= 4.3 FT, BORING RADIUS= 0.417 FT

TEST 1	
MINUTES	FEET
0	1.369
0.0033	1.167
0.0066	0.899
0.01	1.594
0.0133	1.799
0.0166	1.628
0.02	1.581
0.0233	1.534
0.0266	1.489
0.03	1.442
0.0333	1.395
0.0366	1.354
0.04	1.313
0.0433	1.272
0.0466	1.237
0.05	1.199
0.0533	1.164
0.0566	1.13
0.06	1.098
0.0633	1.063
0.0666	1.032
0.07	1.003
0.0733	0.972
0.0766	0.946
0.08	0.918
0.0833	0.893
0.0866	0.871
0.09	0.849
0.0933	0.827
0.0966	0.808
0.1	0.789
0.1033	0.77
0.1066	0.754
0.11	0.738
0.1133	0.722
0.1166	0.71
0.12	0.697
0.1233	0.684
0.1266	0.675
0.13	0.662
0.1333	0.653
0.1366	0.643
0.14	0.637
0.1433	0.628
0.1466	0.618
0.15	0.612
0.1533	0.606
0.1566	0.596
0.16	0.59
0.1633	0.583
0.1666	0.577
0.17	0.571
0.1733	0.568
0.1766	0.561
0.18	0.558
0.1833	0.552
0.1866	0.546
0.19	0.542
0.1933	0.539
0.1966	0.533
0.2	0.53
0.2033	0.527
0.2066	0.523
0.21	0.52
0.2133	0.514
0.2166	0.511
0.22	0.508
0.2233	0.505
0.2266	0.501
0.23	0.498
0.2333	0.495
0.2366	0.492
0.24	0.489
0.2433	0.486
0.2466	0.482
0.25	0.479
0.2533	0.476
0.2566	0.473
0.26	0.47

TEST 2	
MINUTES	FEET
0	0.167
0.0033	1.947
0.0066	1.518
0.01	1.404
0.0133	1.423
0.0166	1.369
0.02	0.751
0.0233	1.739
0.0266	1.755
0.03	1.609
0.0333	1.597
0.0366	1.534
0.04	1.483
0.0433	1.442
0.0466	1.398
0.05	1.36
0.0533	1.322
0.0566	1.281
0.06	1.249
0.0633	1.212
0.0666	1.177
0.07	1.142
0.0733	1.111
0.0766	1.076
0.08	1.047
0.0833	1.016
0.0866	0.987
0.09	0.959
0.0933	0.931
0.0966	0.905
0.1	0.883
0.1033	0.861
0.1066	0.839
0.11	0.817
0.1133	0.798
0.1166	0.779
0.12	0.763
0.1233	0.748
0.1266	0.732
0.13	0.719
0.1333	0.707
0.1366	0.694
0.14	0.681
0.1433	0.672
0.1466	0.662
0.15	0.65
0.1533	0.64
0.1566	0.634
0.16	0.624
0.1633	0.618
0.1666	0.609
0.17	0.602
0.1733	0.596
0.1766	0.59
0.18	0.583
0.1833	0.577
0.1866	0.571
0.19	0.568
0.1933	0.561
0.1966	0.558
0.2	0.552
0.2033	0.549
0.2066	0.542
0.21	0.539
0.2133	0.536
0.2166	0.53
0.22	0.527
0.2233	0.523
0.2266	0.52
0.23	0.517
0.2333	0.514
0.2366	0.511
0.24	0.505
0.2433	0.501
0.2466	0.498
0.25	0.495
0.2533	0.492
0.2566	0.489
0.26	0.486

SHM-93-01A

0.2633	0.467
0.2666	0.464
0.27	0.46
0.2733	0.457
0.2766	0.454
0.28	0.451
0.2833	0.451
0.2866	0.448
0.29	0.445
0.2933	0.441
0.2966	0.438
0.3	0.435
0.3033	0.432
0.3066	0.429
0.31	0.426
0.3133	0.422
0.3166	0.422
0.32	0.419
0.3233	0.416
0.3266	0.413
0.33	0.41
0.3333	0.41
0.35	0.394
0.3666	0.385
0.3833	0.372
0.4	0.359
0.4166	0.35
0.4333	0.34
0.45	0.328
0.4666	0.318
0.4833	0.309
0.5	0.299
0.5166	0.29
0.5333	0.28
0.55	0.274
0.5666	0.265
0.5833	0.258
0.6	0.252
0.6166	0.243
0.6333	0.236
0.65	0.23
0.6666	0.224
0.6833	0.22
0.7	0.214
0.7166	0.208
0.7333	0.202
0.75	0.195
0.7666	0.192
0.7833	0.186
0.8	0.183
0.8166	0.176
0.8333	0.173
0.85	0.17
0.8666	0.164
0.8833	0.16
0.9	0.157
0.9166	0.151
0.9333	0.148
0.95	0.145
0.9666	0.142
0.9833	0.138
1	0.135
1.2	0.097
1.4	0.078
1.6	0.063
1.8	0.053
2	0.044
2.2	0.037
2.4	0.031
2.6	0.028
2.8	0.025
3	0.022
3.2	0.018
3.4	0.018
3.6	0.015
3.8	0.015
4	0.015
4.2	0.015
4.4	0.015
4.6	0.012
4.8	0.012

0.2633	0.482
0.2666	0.479
0.27	0.476
0.2733	0.473
0.2766	0.47
0.28	0.467
0.2833	0.464
0.2866	0.464
0.29	0.46
0.2933	0.454
0.2966	0.454
0.3	0.451
0.3033	0.448
0.3066	0.445
0.31	0.441
0.3133	0.438
0.3166	0.435
0.32	0.432
0.3233	0.429
0.3266	0.426
0.33	0.426
0.3333	0.422
0.35	0.407
0.3666	0.394
0.3833	0.381
0.4	0.369
0.4166	0.356
0.4333	0.347
0.45	0.334
0.4666	0.325
0.4833	0.315
0.5	0.306
0.5166	0.296
0.5333	0.287
0.55	0.277
0.5666	0.271
0.5833	0.265
0.6	0.255
0.6166	0.249
0.6333	0.239
0.65	0.233
0.6666	0.227
0.6833	0.22
0.7	0.214
0.7166	0.208
0.7333	0.202
0.75	0.198
0.7666	0.192
0.7833	0.186
0.8	0.183
0.8166	0.179
0.8333	0.173
0.85	0.17
0.8666	0.164
0.8833	0.16
0.9	0.157
0.9166	0.154
0.9333	0.148
0.95	0.145
0.9666	0.142
0.9833	0.138
1	0.135
1.2	0.097
1.4	0.075
1.6	0.056
1.8	0.047
2	0.037
2.2	0.031
2.4	0.025
2.6	0.022
2.8	0.018
3	0.015
3.2	0.015
3.4	0.012
3.6	0.012
3.8	0.009
4	0.009
4.2	0.009
4.4	0.009
4.6	0.006
4.8	0.006
5	0.006
5.2	0.006
5.4	0.006

5.6	0.006
5.8	0.003
6	0.003

PERMEABILITY TEST RESULTS FOR SHM-93-01A
TEST 1
HVORSLEV:
0.001 CM/SEC
BOUWER AND RICE:
0.004 CM/SEC

TEST 2
HVORSLEV:
0.001 CM/SEC
BOUWER AND RICE:
0.009 CM/SEC

SHM-93-01A

AQUIFER TESTING COMPLETION CHECKLIST

AQUIFER TEST NO. _____

SETUP	DATE	BY WHOM
MONITORING WELL ID	SHM-93-01A	R RUSTAD / N ZOKA
DATE OF TEST	4.1.93	
TYPE OF TEST	RISEING HEAD	
HERMIT TYPE/SERIAL#	SE 1000C / 1R601732	
TEST #	SEL 3 / 10W 2	
DATA COLLECTION RATE	LOW 000	
TRANSDUCER		
SERIAL #	2045 DE	
PSIG	10	
SCALE FACTOR	1.783	
OFFSET	- 0.035	
INPUT CHANNEL	IND 1	
TEST DATA		
INPUT MODE (TOC/SUR)	TOC	
STATIC WATER LEVEL (FT./TOC)	21.24' (PVC)	
WELL DEPTH (FT./TOC)	25.5	
XD DEPTH (FT.TOC)	25.0	
INITIAL XD REFERENCE	6.07	
SLUG DEPTH (FT./TOC)	24.0	
TIME OF SLUG PLACEMENT	0845	
TIME OF WL EQUILIBRATION	0847	
NEW XD REFERENCE	6.08	
START TIME OF TEST	0855	
END TIME OF TEST	0859	
NOTES: +0.004 LINEARITY		

FIGURE 4-14
AQUIFER TEST COMPLETION CHECKLIST
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

3x3" BAR STOCK PVE

AQUIFER TESTING COMPLETION CHECKLIST

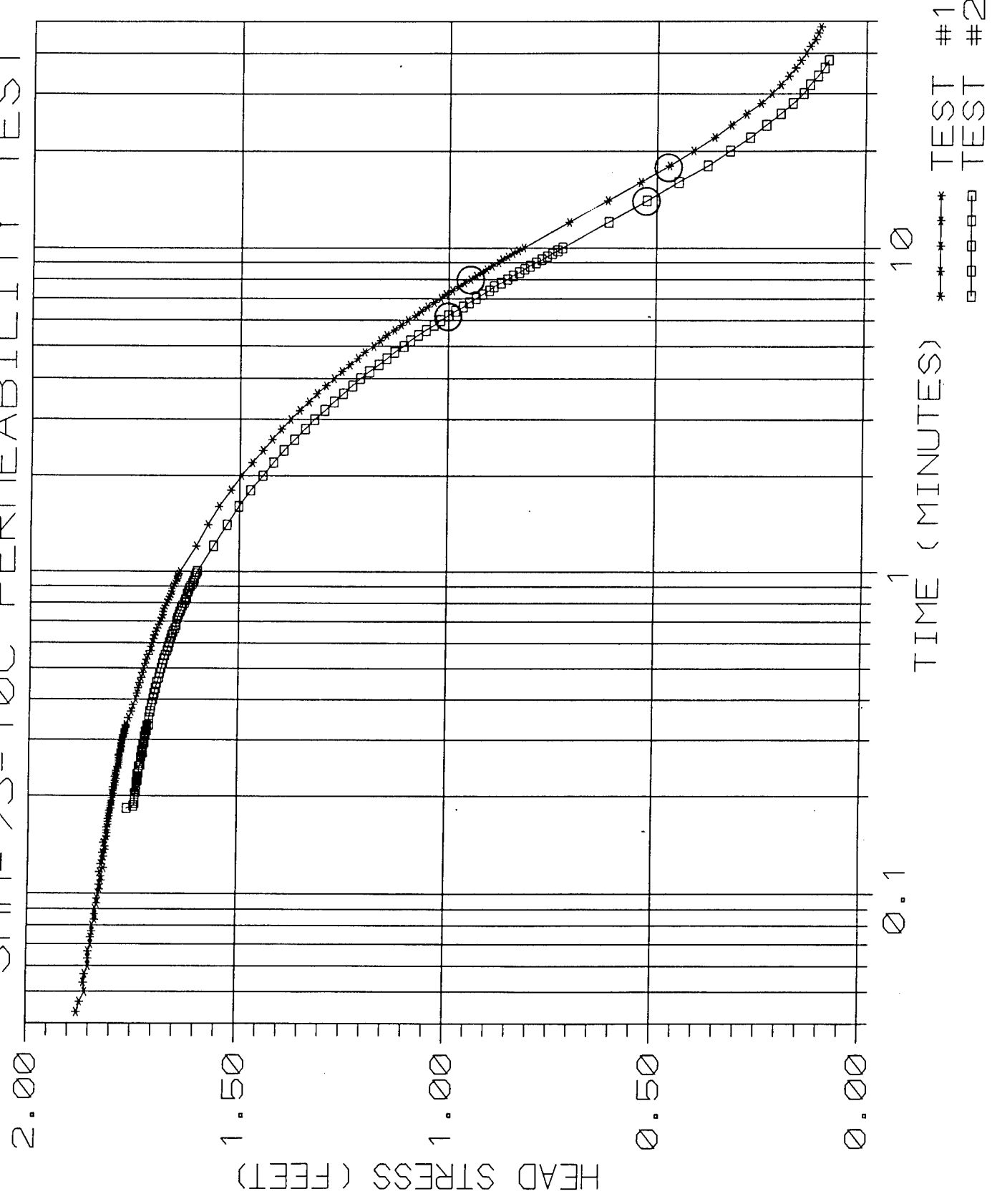
AQUIFER TEST NO. _____

SETUP	DATE	BY WHOM
MONITORING WELL ID	SLM-93-01A	RUSTAD/ROKA
DATE OF TEST	4.01.93	
TYPE OF TEST	RIISING HEAD	
HERMIT TYPE/SERIAL#	SL 1000C / 1201932	
TEST #	SEL 4 2 OF 2	
DATA COLLECTION RATE	LOW 000	
TRANSDUCER		
SERIAL #	2045 DE	
PSIG	10	
SCALE FACTOR	9.983	
OFFSET	-0.035	
INPUT CHANNEL	IN 1	
TEST DATA		
INPUT MODE (TOC/SUR)	TOC	
STATIC WATER LEVEL (FT./TOC)	21.24	
WELL DEPTH (FT./TOC)	25.5	
XD DEPTH (FT./TOC)	25.0	
INITIAL XD REFERENCE	6.02	
SLUG DEPTH (FT./TOC)	24.0	
TIME OF SLUG PLACEMENT	0902	
TIME OF WL EQUILIBRATION	0905	
NEW XD REFERENCE	6.05	
START TIME OF TEST	0902	
END TIME OF TEST		
NOTES: Linearity = +0.004		

FIGURE 4-14
AQUIFER TEST COMPLETION CHECKLIST
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

3' x 3" BAR Stock PVC

SHM-93-10C PERMEABILITY TEST



SHM-93-10C

WELL RADIUS= 0.167 FT, SATURATED SCREEN LENGTH= 10 FT, BORING RADIUS= 0.234 FT

TEST 1

MINUTES	FEET
0	1.155
0.0033	0.745
0.0066	0.77
0.01	0.454
0.0133	0.464
0.0166	0.899
0.02	0.501
0.0233	0.479
0.0266	1.079
0.03	1.578
0.0333	1.947
0.0366	1.903
0.04	1.862
0.0433	1.878
0.0466	1.871
0.05	1.859
0.0533	1.862
0.0566	1.859
0.06	1.852
0.0633	1.852
0.0666	1.852
0.07	1.846
0.0733	1.846
0.0766	1.843
0.08	1.843
0.0833	1.837
0.0866	1.837
0.09	1.837
0.0933	1.833
0.0966	1.833
0.1	1.83
0.1033	1.827
0.1066	1.827
0.11	1.824
0.1133	1.824
0.1166	1.827
0.12	1.818
0.1233	1.824
0.1266	1.821
0.13	1.818
0.1333	1.821
0.1366	1.815
0.14	1.815
0.1433	1.818
0.1466	1.815
0.15	1.811
0.1533	1.811
0.1566	1.811
0.16	1.811
0.1633	1.808
0.1666	1.808
0.17	1.808
0.1733	1.805
0.1766	1.805
0.18	1.805
0.1833	1.802
0.1866	1.802
0.19	1.802
0.1933	1.799
0.1966	1.799
0.2	1.799
0.2033	1.796
0.2066	1.796
0.21	1.796
0.2133	1.796
0.2166	1.792
0.22	1.792
0.2233	1.792
0.2266	1.789
0.23	1.792
0.2333	1.789
0.2366	1.789
0.24	1.789
0.2433	1.786
0.2466	1.786
0.25	1.783
0.2533	1.783
0.2566	1.783
0.26	1.783
0.2633	1.783

TEST 2

MINUTES	FEET
0	0.959
0.0033	1.215
0.0066	1.294
0.01	1.325
0.0133	1.663
0.0166	1.786
0.02	1.96
0.0233	1.96
0.0266	1.893
0.03	1.767
0.0333	1.887
0.0366	1.912
0.04	2.01
0.0433	2.064
0.0466	2.026
0.05	1.96
0.0533	1.631
0.0566	1.603
0.06	1.792
0.0633	1.672
0.0666	1.811
0.07	1.837
0.0733	1.862
0.0766	1.887
0.08	1.941
0.0833	1.89
0.0866	1.827
0.09	1.792
0.0933	1.846
0.0966	1.909
0.1	1.764
0.1033	1.874
0.1066	1.909
0.11	1.808
0.1133	1.676
0.1166	1.278
0.12	1.527
0.1233	1.975
0.1266	1.969
0.13	1.682
0.1333	1.578
0.1366	1.717
0.14	1.975
0.1433	1.938
0.1466	1.745
0.15	1.552
0.1533	1.691
0.1566	1.871
0.16	1.77
0.1633	1.663
0.1666	1.742
0.17	1.805
0.1733	1.764
0.1766	1.72
0.18	1.742
0.1833	1.764
0.1866	1.748
0.19	1.745
0.1933	1.745
0.1966	1.745
0.2	1.745
0.2033	1.745
0.2066	1.742
0.21	1.742
0.2133	1.742
0.2166	1.742
0.22	1.742
0.2233	1.739
0.2266	1.739
0.23	1.739
0.2333	1.739
0.2366	1.736
0.24	1.736
0.2433	1.736
0.2466	1.736
0.25	1.732
0.2533	1.732
0.2566	1.732
0.26	1.732
0.2633	1.732

SHM-93-10C

0.2666	1.783
0.27	1.783
0.2733	1.78
0.2766	1.78
0.28	1.78
0.2833	1.777
0.2866	1.777
0.29	1.777
0.2933	1.777
0.2966	1.777
0.3	1.774
0.3033	1.774
0.3066	1.774
0.31	1.774
0.3133	1.77
0.3166	1.77
0.32	1.77
0.3233	1.77
0.3266	1.767
0.33	1.767
0.3333	1.767
0.35	1.761
0.3666	1.755
0.3833	1.751
0.4	1.745
0.4166	1.742
0.4333	1.739
0.45	1.736
0.4666	1.732
0.4833	1.729
0.5	1.726
0.5166	1.723
0.5333	1.72
0.55	1.717
0.5666	1.71
0.5833	1.71
0.6	1.707
0.6166	1.704
0.6333	1.701
0.65	1.698
0.6666	1.695
0.6833	1.691
0.7	1.688
0.7166	1.685
0.7333	1.682
0.75	1.682
0.7666	1.679
0.7833	1.676
0.8	1.673
0.8166	1.669
0.8333	1.666
0.85	1.663
0.8666	1.66
0.8833	1.66
0.9	1.657
0.9166	1.654
0.9333	1.65
0.95	1.647
0.9666	1.647
0.9833	1.644
1	1.641
1.2	1.603
1.4	1.575
1.6	1.549
1.8	1.521
2	1.496
2.2	1.47
2.4	1.445
2.6	1.423
2.8	1.401
3	1.379
3.2	1.357
3.4	1.335
3.6	1.316
3.8	1.294
4	1.275
4.2	1.256
4.4	1.237
4.6	1.218
4.8	1.202
5	1.18
5.2	1.164
5.4	1.149
5.6	1.13

0.2666	1.729
0.27	1.729
0.2733	1.726
0.2766	1.729
0.28	1.726
0.2833	1.726
0.2866	1.726
0.29	1.726
0.2933	1.723
0.2966	1.723
0.3	1.723
0.3033	1.723
0.3066	1.723
0.31	1.72
0.3133	1.72
0.3166	1.72
0.32	1.717
0.3233	1.717
0.3266	1.717
0.33	1.717
0.3333	1.713
0.35	1.713
0.3666	1.71
0.3833	1.707
0.4	1.704
0.4166	1.701
0.4333	1.698
0.45	1.695
0.4666	1.691
0.4833	1.688
0.5	1.685
0.5166	1.682
0.5333	1.679
0.55	1.676
0.5666	1.672
0.5833	1.669
0.6	1.666
0.6166	1.663
0.6333	1.66
0.65	1.657
0.6666	1.653
0.6833	1.65
0.7	1.65
0.7166	1.647
0.7333	1.644
0.75	1.641
0.7666	1.638
0.7833	1.635
0.8	1.631
0.8166	1.628
0.8333	1.625
0.85	1.625
0.8666	1.622
0.8833	1.619
0.9	1.616
0.9166	1.612
0.9333	1.609
0.95	1.606
0.9666	1.606
0.9833	1.603
1	1.6
1.2	1.562
1.4	1.53
1.6	1.502
1.8	1.474
2	1.445
2.2	1.42
2.4	1.395
2.6	1.369
2.8	1.344
3	1.322
3.2	1.297
3.4	1.275
3.6	1.253
3.8	1.231
4	1.212
4.2	1.19
4.4	1.167
4.6	1.148
4.8	1.13
5	1.107
5.2	1.092
5.4	1.073
5.6	1.054

5.8	1.114
6	1.098
6.2	1.079
6.4	1.066
6.6	1.051
6.8	1.035
7	1.019
7.2	1.007
7.4	0.991
7.6	0.975
7.8	0.962
8	0.947
8.2	0.934
8.4	0.921
8.6	0.909
8.8	0.896
9	0.88
9.2	0.871
9.4	0.858
9.6	0.846
9.8	0.833
10	0.82
12	0.71
14	0.618
16	0.539
18	0.47
20	0.413
22	0.363
24	0.322
26	0.287
28	0.252
30	0.227
32	0.205
34	0.186
36	0.17
38	0.157
40	0.145
42	0.135
44	0.123
46	0.116
48	0.11

PERMEABILITY TEST RESULTS FOR SHM-93-10C:

TEST 1

HVORSLEV:

0.00002 CM/SEC

BOUWER AND RICE:

0.0002 CM/SEC

5.8	1.035
6	1.019
6.2	1
6.4	0.984
6.6	0.965
6.8	0.95
7	0.934
7.2	0.918
7.4	0.902
7.6	0.89
7.8	0.874
8	0.858
8.2	0.845
8.4	0.83
8.6	0.817
8.8	0.804
9	0.789
9.2	0.776
9.4	0.763
9.6	0.751
9.8	0.738
10	0.726
12	0.615
14	0.524
16	0.448
18	0.378
20	0.325
22	0.277
24	0.239
26	0.205
28	0.176
30	0.151
32	0.135
34	0.116
36	0.101
38	0.091

TEST 2

HVORSLEV:

0.00002 CM/SEC

BOUWER AND RICE:

0.0002 CM/SEC

AQUIFER TESTING COMPLETION CHECKLIST

AQUIFER TEST NO. _____

SETUP	DATE	BY WHOM
MONITORING WELL ID	SUM-93-10c	N Ruxa / R RUSTAD
DATE OF TEST	3.31.93	
TYPE OF TEST	RIISING HEAD	
HERMIT TYPE/SERIAL#	1K20732 / SE 10000	
TEST #	SEL 1	
DATA COLLECTION RATE	LOW 000	
TRANSDUCER		
SERIAL #	2045DE	
PSIG	10	
SCALE FACTOR	9.983	
OFFSET	- 0.035	
INPUT CHANNEL	INP 1	
TEST DATA		
INPUT MODE (TOC/SUR)	TOC	
STATIC WATER LEVEL (FT./TOC)	29.79	
WELL DEPTH (FT./TOC)	56'	
XD DEPTH (FT./TOC)	45'	
INITIAL XD REFERENCE	0'	
SLUG DEPTH (FT./TOC)	40'	
TIME OF SLUG PLACEMENT	1500	
TIME OF WL EQUILIBRATION	1520	
NEW XD REFERENCE	0' 16.50 FROM XD KEY PRIOR TO START	
START TIME OF TEST	1530	
END TIME OF TEST	1625	
NOTES: LINEARITY 0.004		

3' x 3" BAR STOCK PVC

FIGURE 4-14
AQUIFER TEST COMPLETION CHECKLIST
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

AQUIFER TESTING COMPLETION CHECKLIST

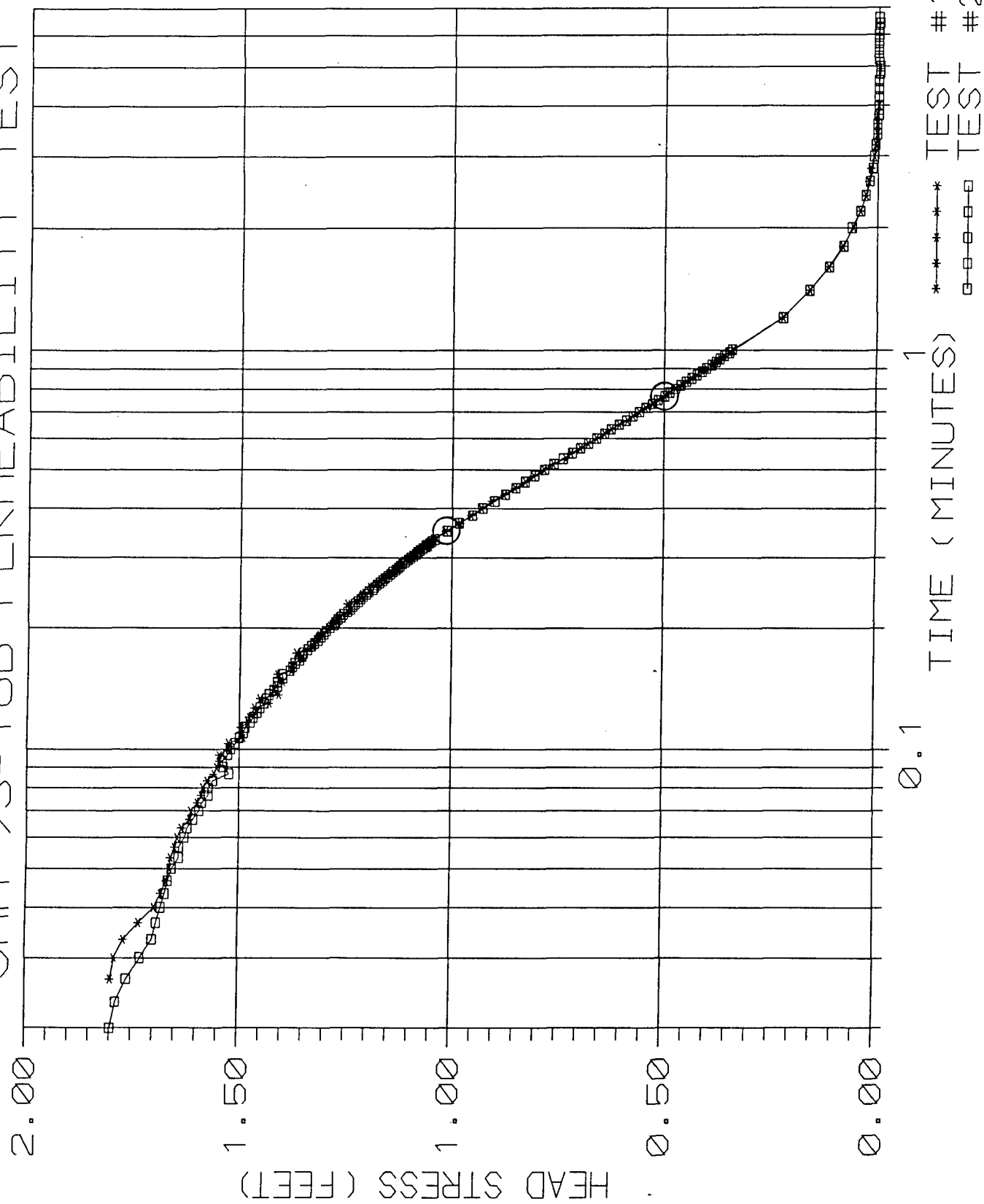
AQUIFER TEST NO. _____

SETUP	DATE	BY WHOM
MONITORING WELL ID	5HM-93-10C	R RUSTAD / N ROKA
DATE OF TEST	3.31.93	
TYPE OF TEST	FALLING HEAD	
HERMIT TYPE/SERIAL#	SE 1000 C / 1KCO732	
TEST #	SEL 2 (2002)	
DATA COLLECTION RATE	LOG 000	
TRANSDUCER		
SERIAL #	2045DE	
PSIG	10	
SCALE FACTOR	9.983	
OFFSET	-0.035	
INPUT CHANNEL	INP 1	
TEST DATA		
INPUT MODE (TOC/SUR)	SUR	
STATIC WATER LEVEL (FT./TOC)	29.79	
WELL DEPTH (FT./TOC)	56'	
XD DEPTH (FT.TOC)	45'	
INITIAL XD REFERENCE	16.40	
SLUG DEPTH (FT./TOC)	40.0'	
TIME OF SLUG PLACEMENT	16:30	
TIME OF WL EQUILIBRATION	—	
NEW XD REFERENCE	—	
START TIME OF TEST	1630	
END TIME OF TEST	1725	
NOTES:		

FIGURE 4-14
 AQUIFER TEST COMPLETION CHECKLIST
 PROJECT OPERATIONS PLAN
 FORT DEVENS, MASSACHUSETTS
 ABB Environmental Services, Inc.

3' x 3" BAR Stock PVC

SHM-93-18B PERMEABILITY TEST



SHM-93-18B

WELL RADIUS= 0.167 FT, SATURATED SCREEN LENGTH= 10 FT, BORING RADIUS= 0.417 FT

TEST 1	
MINUTES	FEET
0	1.234
0.0033	0.963
0.0066	0.653
0.01	0.704
0.0133	1.187
0.0166	1.616
0.02	1.742
0.0233	1.783
0.0266	1.799
0.03	1.79
0.0333	1.768
0.0366	1.733
0.04	1.698
0.0433	1.682
0.0466	1.67
0.05	1.663
0.0533	1.66
0.0566	1.651
0.06	1.645
0.0633	1.635
0.0666	1.616
0.07	1.613
0.0733	1.597
0.0766	1.588
0.08	1.585
0.0833	1.575
0.0866	1.559
0.09	1.553
0.0933	1.547
0.0966	1.547
0.1	1.525
0.1033	1.525
0.1066	1.49
0.11	1.496
0.1133	1.496
0.1166	1.48
0.12	1.477
0.1233	1.461
0.1266	1.465
0.13	1.43
0.1333	1.452
0.1366	1.408
0.14	1.42
0.1433	1.414
0.1466	1.398
0.15	1.408
0.1533	1.411
0.1566	1.379
0.16	1.376
0.1633	1.376
0.1666	1.354
0.17	1.36
0.1733	1.367
0.1766	1.345
0.18	1.329
0.1833	1.326
0.1866	1.319
0.19	1.31
0.1933	1.313
0.1966	1.297
0.2	1.291
0.2033	1.288
0.2066	1.278
0.21	1.269
0.2133	1.269
0.2166	1.259
0.22	1.24
0.2233	1.244
0.2266	1.24
0.23	1.247
0.2333	1.228
0.2366	1.218
0.24	1.212
0.2433	1.212
0.2466	1.196
0.25	1.193
0.2533	1.193
0.2566	1.18

TEST 2	
MINUTES	FEET
0	1.161
0.0033	0.65
0.0066	1.363
0.01	1.736
0.0133	1.796
0.0166	1.786
0.02	1.799
0.0233	1.786
0.0266	1.761
0.03	1.729
0.0333	1.701
0.0366	1.692
0.04	1.682
0.0433	1.673
0.0466	1.666
0.05	1.657
0.0533	1.641
0.0566	1.641
0.06	1.628
0.0633	1.622
0.0666	1.609
0.07	1.594
0.0733	1.587
0.0766	1.572
0.08	1.572
0.0833	1.562
0.0866	1.524
0.09	1.537
0.0933	1.54
0.0966	1.527
0.1	1.521
0.1033	1.508
0.1066	1.499
0.11	1.49
0.1133	1.486
0.1166	1.474
0.12	1.467
0.1233	1.458
0.1266	1.452
0.13	1.442
0.1333	1.436
0.1366	1.43
0.14	1.42
0.1433	1.411
0.1466	1.411
0.15	1.398
0.1533	1.401
0.1566	1.382
0.16	1.376
0.1633	1.37
0.1666	1.36
0.17	1.354
0.1733	1.351
0.1766	1.341
0.18	1.332
0.1833	1.325
0.1866	1.316
0.19	1.31
0.1933	1.303
0.1966	1.297
0.2	1.288
0.2033	1.278
0.2066	1.275
0.21	1.269
0.2133	1.262
0.2166	1.256
0.22	1.246
0.2233	1.24
0.2266	1.234
0.23	1.228
0.2333	1.221
0.2366	1.215
0.24	1.209
0.2433	1.202
0.2466	1.196
0.25	1.186
0.2533	1.183
0.2566	1.177

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0.26	1.174
0.2633	1.168
0.2666	1.162
0.27	1.152
0.2733	1.149
0.2766	1.146
0.28	1.136
0.2833	1.13
0.2866	1.127
0.29	1.117
0.2933	1.121
0.2966	1.105
0.3	1.102
0.3033	1.095
0.3066	1.089
0.31	1.086
0.3133	1.079
0.3166	1.073
0.32	1.054
0.3233	1.067
0.3266	1.054
0.33	1.051
0.3333	1.045
0.35	1.016
0.3666	0.982
0.3833	0.956
0.4	0.931
0.4166	0.906
0.4333	0.877
0.45	0.852
0.4666	0.827
0.4833	0.808
0.5	0.783
0.5166	0.761
0.5333	0.732
0.55	0.72
0.5666	0.698
0.5833	0.679
0.6	0.66
0.6166	0.641
0.6333	0.625
0.65	0.606
0.6666	0.587
0.6833	0.574
0.7	0.559
0.7166	0.543
0.7333	0.527
0.75	0.514
0.7666	0.499
0.7833	0.486
0.8	0.473
0.8166	0.458
0.8333	0.448
0.85	0.436
0.8666	0.423
0.8833	0.41
0.9	0.401
0.9166	0.388
0.9333	0.379
0.95	0.369
0.9666	0.36
0.9833	0.347
1	0.338
1.2	0.221
1.4	0.158
1.6	0.114
1.8	0.082
2	0.057
2.2	0.041
2.4	0.028
2.6	0.022
2.8	0.016
3	0.009
3.2	0.006
3.4	0.003
3.6	0.003
3.8	0.003
4	0

0.26	1.171
0.2633	1.164
0.2666	1.158
0.27	1.152
0.2733	1.145
0.2766	1.139
0.28	1.133
0.2833	1.127
0.2866	1.123
0.29	1.117
0.2933	1.111
0.2966	1.104
0.3	1.098
0.3033	1.092
0.3066	1.085
0.31	1.082
0.3133	1.076
0.3166	1.07
0.32	1.063
0.3233	1.06
0.3266	1.054
0.33	1.048
0.3333	1.041
0.35	1.013
0.3666	0.984
0.3833	0.953
0.4	0.928
0.4166	0.899
0.4333	0.874
0.45	0.849
0.4666	0.827
0.4833	0.805
0.5	0.782
0.5166	0.76
0.5333	0.738
0.55	0.716
0.5666	0.697
0.5833	0.678
0.6	0.659
0.6166	0.64
0.6333	0.625
0.65	0.606
0.6666	0.59
0.6833	0.574
0.7	0.558
0.7166	0.543
0.7333	0.527
0.75	0.514
0.7666	0.498
0.7833	0.486
0.8	0.473
0.8166	0.461
0.8333	0.448
0.85	0.435
0.8666	0.423
0.8833	0.41
0.9	0.401
0.9166	0.388
0.9333	0.378
0.95	0.369
0.9666	0.36
0.9833	0.347
1	0.341
1.2	0.221
1.4	0.158
1.6	0.113
1.8	0.079
2	0.06
2.2	0.041
2.4	0.028
2.6	0.019
2.8	0.012
3	0.009
3.2	0.006
3.4	0.003
3.6	0.003
3.8	0
4	0
4.2	0
4.4	0
4.6	0
4.8	-0.003
5	-0.003
5.2	0

5.4	0
5.6	0
5.8	0
6	0
6.2	0
6.4	-0.003
6.6	0

PERMEABILITY TEST RESULTS FOR SHM-93-18B:

TEST 1

HVORSLEV:

0.0002 CM/SEC

BOUWER AND RICE:

0.004 CM/SEC

TEST 2

HVORSLEV:

0.0002 CM/SEC

BOUWER AND RICE:

0.004 CM/SEC

SHM-93-18B

AQUIFER TESTING COMPLETION CHECKLIST

AQUIFER TEST NO. _____

SETUP	DATE	BY WHOM
MONITORING WELL ID	SUM-93-18 B	RUSTAD/Raka
DATE OF TEST	4-01-93	
TYPE OF TEST	Rising Head	
HERMIT TYPE/SERIAL#	SE 1000/MCO1732	
TEST #	SEL 5 10F2	
DATA COLLECTION RATE	LOW 000	
TRANSDUCER		
SERIAL #	2045DE	
PSIG	10	
SCALE FACTOR	9.983	
OFFSET	-0.035	
INPUT CHANNEL	INP 1	
TEST DATA		
INPUT MODE (TOC/SUR)	TOC	
STATIC WATER LEVEL (FT./TOC)	18.47	
WELL DEPTH (FT./TOC)	90'	
XD DEPTH (FT./TOC)	4.62 32'	
INITIAL XD REFERENCE	11.68	
SLUG DEPTH (FT./TOC)	23'	
TIME OF SLUG PLACEMENT	0940	
TIME OF WL EQUILIBRATION	0942	
NEW XD REFERENCE	11.81	
START TIME OF TEST	0943	
END TIME OF TEST		
NOTES: Linearity = +0.004		

FIGURE 4-14
AQUIFER TEST COMPLETION CHECKLIST
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

3' x 3" Bar Stock PVC

3-20-1993

AQUIFER TESTING COMPLETION CHECKLIST

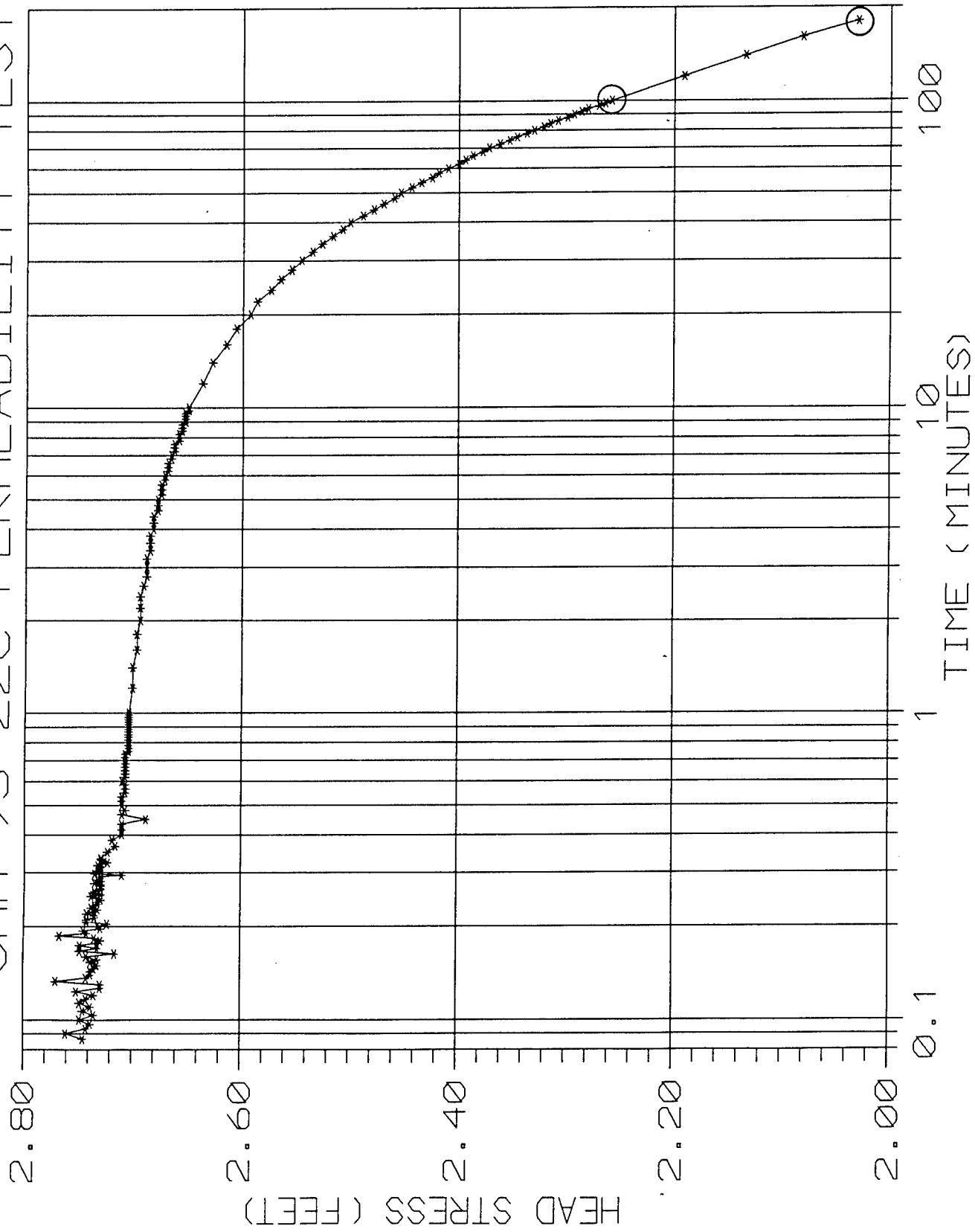
AQUIFER TEST NO. _____

SETUP	DATE	BY WHOM
MONITORING WELL ID	SHM-93-18B	R. Rustad/N. Roka
DATE OF TEST	4.1.93	
TYPE OF TEST	Rising head	
HERMIT TYPE/SERIAL#	SE 1000C/1001732	
TEST #	SEL 6 2 of 2	
DATA COLLECTION RATE	Log 000	
TRANSDUCER		
SERIAL #	2045DE	
PSIG	10	
SCALE FACTOR	10 9.983	
OFFSET	-0.035	
INPUT CHANNEL	inp. 1	
TEST DATA		
INPUT MODE (TOC/SUR)	Entoc	
STATIC WATER LEVEL (FT./TOC)	18.47'	
WELL DEPTH (FT./TOC)	90'	
XD DEPTH (FT./TOC)	32'	
INITIAL XD REFERENCE	11.71	
SLUG DEPTH (FT./TOC)	23'	
TIME OF SLUG PLACEMENT	1005 1000	
TIME OF WL EQUILIBRATION	1005	
NEW XD REFERENCE	11.71	
START TIME OF TEST	1006	
END TIME OF TEST		
NOTES: Linearity = +0.004		

3'x3" Bar stock PVC

FIGURE 4-14
AQUIFER TEST COMPLETION CHECKLIST
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

SHM-93-22C PERMEABILITY TEST



SHM-93-22C

WELL RADIUS= 0.167 FT, SATURATED SCREEN LENGTH= 10 FT, BORING RADIUS= 0.234 FT

TEST 1	
MINUTES	FEET
0	0.828
0.0033	0.825
0.0066	1.685
0.01	1.828
0.0133	1.594
0.0166	1.435
0.02	1.439
0.0233	1.654
0.0266	1.622
0.03	1.704
0.0333	1.613
0.0366	1.584
0.04	1.372
0.0433	1.78
0.0466	2.391
0.05	2.738
0.0533	2.751
0.0566	2.792
0.06	2.764
0.0633	2.745
0.0666	2.754
0.07	2.757
0.0733	2.723
0.0766	2.742
0.08	2.764
0.0833	2.751
0.0866	2.745
0.09	2.761
0.0933	2.742
0.0966	2.738
0.1	2.748
0.1033	2.735
0.1066	2.745
0.11	2.738
0.1133	2.748
0.1166	2.742
0.12	2.735
0.1233	2.751
0.1266	2.729
0.13	2.729
0.1333	2.77
0.1366	2.742
0.14	2.738
0.1433	2.738
0.1466	2.735
0.15	2.732
0.1533	2.738
0.1566	2.732
0.16	2.742
0.1633	2.716
0.1666	2.748
0.17	2.732
0.1733	2.748
0.1766	2.732
0.18	2.729
0.1833	2.735
0.1866	2.767
0.19	2.742
0.1933	2.745
0.1966	2.729
0.2	2.732
0.2033	2.723
0.2066	2.742
0.21	2.742
0.2133	2.735
0.2166	2.735
0.22	2.742
0.2233	2.735
0.2266	2.732
0.23	2.738
0.2333	2.735
0.2366	2.732
0.24	2.732
0.2433	2.729
0.2466	2.732
0.25	2.738
0.2533	2.729
0.2566	2.735

SHM-93-22C

0.26	2.735
0.2633	2.729
0.2666	2.729
0.27	2.729
0.2733	2.729
0.2766	2.735
0.28	2.729
0.2833	2.732
0.2866	2.729
0.29	2.729
0.2933	2.71
0.2966	2.735
0.3	2.732
0.3033	2.732
0.3066	2.729
0.31	2.729
0.3133	2.729
0.3166	2.732
0.32	2.729
0.3233	2.723
0.3266	2.726
0.33	2.729
0.3333	2.729
0.35	2.723
0.3666	2.716
0.3833	2.719
0.4	2.71
0.4166	2.71
0.4333	2.71
0.45	2.688
0.4666	2.71
0.4833	2.707
0.5	2.71
0.5166	2.71
0.5333	2.71
0.55	2.707
0.5666	2.707
0.5833	2.707
0.6	2.71
0.6166	2.707
0.6333	2.707
0.65	2.707
0.6666	2.707
0.6833	2.707
0.7	2.707
0.7166	2.707
0.7333	2.707
0.75	2.704
0.7666	2.704
0.7833	2.704
0.8	2.704
0.8166	2.704
0.8333	2.704
0.85	2.704
0.8666	2.704
0.8833	2.704
0.9	2.704
0.9166	2.704
0.9333	2.704
0.95	2.704
0.9666	2.704
0.9833	2.704
1	2.704
1.2	2.701
1.4	2.701
1.6	2.697
1.8	2.697
2	2.694
2.2	2.694
2.4	2.694
2.6	2.691
2.8	2.688
3	2.688
3.2	2.688
3.4	2.685
3.6	2.685
3.8	2.685
4	2.682
4.2	2.682
4.4	2.682
4.6	2.678
4.8	2.678
5	2.678
5.2	2.675

5.4	2.675
5.6	2.675
5.8	2.672
6	2.672
6.2	2.669
6.4	2.669
6.6	2.669
6.8	2.666
7	2.666
7.2	2.663
7.4	2.663
7.6	2.663
7.8	2.659
8	2.659
8.2	2.659
8.4	2.656
8.6	2.656
8.8	2.656
9	2.653
9.2	2.653
9.4	2.653
9.6	2.653
9.8	2.65
10	2.65
12	2.637
14	2.628
16	2.615
18	2.606
20	2.593
22	2.587
24	2.574
26	2.565
28	2.555
30	2.546
32	2.536
34	2.527
36	2.517
38	2.508
40	2.501
42	2.489
44	2.479
46	2.47
48	2.46
50	2.454
52	2.444
54	2.435
56	2.425
58	2.419
60	2.41
62	2.4
64	2.394
66	2.387
68	2.378
70	2.372
72	2.362
74	2.353
76	2.346
78	2.337
80	2.33
82	2.321
84	2.315
86	2.308
88	2.299
90	2.293
92	2.286
94	2.28
96	2.27
98	2.264
100	2.258
120	2.191
140	2.134
160	2.081
180	2.03

PERMEABILITY TEST RESULTS FOR SHM-93-22C:
 TEST 1
 HVORSLEV:
 9 E-08 CM/SEC
 BOUWER AND RICE:
 6 E-06 CM/SEC

SHM-93-22C

AQUIFER TESTING COMPLETION CHECKLIST

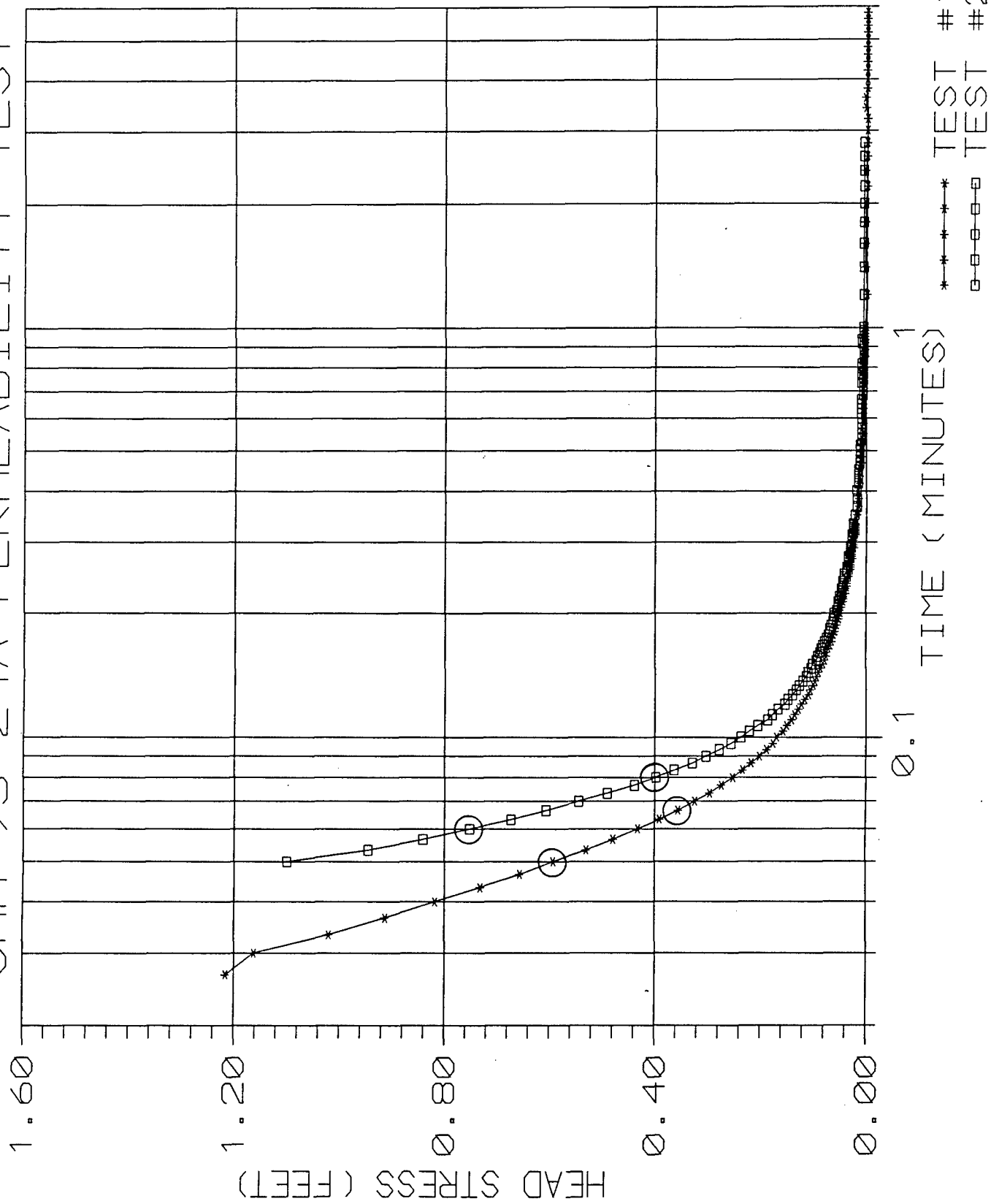
AQUIFER TEST NO. 00

SETUP	DATE	BY WHOM
MONITORING WELL ID	SHM-93-22C	R. RUSTAD / N. RORER
DATE OF TEST	3.31.93	
TYPE OF TEST	RISEING HEAD	
HERMIT TYPE/SERIAL#	SE 1000C / 1KCO1732	
TEST #	SEL 0	
DATA COLLECTION RATE	Log 000	
TRANSDUCER		
SERIAL #	2046DE	
PSIG	10	
SCALE FACTOR	10.001	
OFFSET	-0.034	
INPUT CHANNEL	INP # 1	
TEST DATA		
INPUT MODE (TOC/SUR)	TOC	
STATIC WATER LEVEL (FT./TOC)	6.64'	
WELL DEPTH (FT./TOC)		
XD DEPTH (FT./TOC)	15'	
INITIAL XD REFERENCE	0	
SLUG DEPTH (FT./TOC)	11'	
TIME OF SLUG PLACEMENT	9:30	
TIME OF WL EQUILIBRATION	5:5 11:45	NOT QUITE EQUILIBRATED
NEW XD REFERENCE	0.89 (5.8')	
START TIME OF TEST	12:00	
END TIME OF TEST	15:10	
NOTES:	LINEARITY +.002	

FIGURE 4-14
AQUIFER TEST COMPLETION CHECKLIST
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

3' x 3" BAR STOCK PVC

SHM-93-24A PERMEABILITY TEST



SHM-93-24A

WELL RADIUS= 0.167 FT, SATURATED SCREEN LENGTH= 10 FT, BORING RADIUS= 0.417 FT

TEST 1		TEST 2	
MINUTES	FEET	MINUTES	FEET
0	0	0	0
0.0033	1.09	0.0033	0.041
0.0066	1.118	0.0066	0.844
0.01	0.596	0.01	1.347
0.0133	0.432	0.0133	0.774
0.0166	0.353	0.0166	0.363
0.02	0.331	0.02	0.746
0.0233	1.046	0.0233	0.42
0.0266	1.216	0.0266	0.774
0.03	1.163	0.03	0.426
0.0333	1.02	0.0333	0.638
0.0366	0.913	0.0366	0.142
0.04	0.818	0.04	0.256
0.0433	0.732	0.0433	0.746
0.0466	0.657	0.0466	1.062
0.05	0.593	0.05	1.1
0.0533	0.53	0.0533	0.945
0.0566	0.479	0.0566	0.841
0.06	0.432	0.06	0.752
0.0633	0.391	0.0633	0.673
0.0666	0.356	0.0666	0.607
0.07	0.324	0.07	0.544
0.0733	0.296	0.0733	0.49
0.0766	0.274	0.0766	0.439
0.08	0.252	0.08	0.398
0.0833	0.233	0.0833	0.363
0.0866	0.217	0.0866	0.328
0.09	0.201	0.09	0.303
0.0933	0.188	0.0933	0.278
0.0966	0.176	0.0966	0.256
0.1	0.169	0.1	0.237
0.1033	0.157	0.1033	0.221
0.1066	0.15	0.1066	0.205
0.11	0.141	0.11	0.186
0.1133	0.135	0.1133	0.177
0.1166	0.128	0.1166	0.167
0.12	0.122	0.12	0.154
0.1233	0.116	0.1233	0.148
0.1266	0.109	0.1266	0.139
0.13	0.106	0.13	0.132
0.1333	0.1	0.1333	0.126
0.1366	0.097	0.1366	0.12
0.14	0.094	0.14	0.113
0.1433	0.09	0.1433	0.11
0.1466	0.087	0.1466	0.104
0.15	0.081	0.15	0.101
0.1533	0.078	0.1533	0.094
0.1566	0.075	0.1566	0.091
0.16	0.075	0.16	0.088
0.1633	0.071	0.1633	0.085
0.1666	0.068	0.1666	0.082
0.17	0.065	0.17	0.079
0.1733	0.065	0.1733	0.075
0.1766	0.062	0.1766	0.072
0.18	0.059	0.18	0.069
0.1833	0.059	0.1833	0.069
0.1866	0.056	0.1866	0.066
0.19	0.056	0.19	0.063
0.1933	0.052	0.1933	0.063
0.1966	0.052	0.1966	0.06
0.2	0.049	0.2	0.06
0.2033	0.049	0.2033	0.056
0.2066	0.046	0.2066	0.053
0.21	0.046	0.21	0.053
0.2133	0.043	0.2133	0.053
0.2166	0.043	0.2166	0.05
0.22	0.043	0.22	0.05
0.2233	0.04	0.2233	0.047
0.2266	0.04	0.2266	0.047
0.23	0.04	0.23	0.047
0.2333	0.037	0.2333	0.044
0.2366	0.037	0.2366	0.044
0.24	0.037	0.24	0.044
0.2433	0.037	0.2433	0.041
0.2466	0.033	0.2466	0.041
0.25	0.033	0.25	0.041
0.2533	0.033	0.2533	0.037
0.2566	0.03	0.2566	0.037

SHM-93-24A

0.26	0.03
0.2633	0.03
0.2666	0.03
0.27	0.03
0.2733	0.027
0.2766	0.027
0.28	0.027
0.2833	0.027
0.2866	0.027
0.29	0.024
0.2933	0.024
0.2966	0.024
0.3	0.024
0.3033	0.024
0.3066	0.024
0.31	0.024
0.3133	0.021
0.3166	0.021
0.32	0.021
0.3233	0.021
0.3266	0.021
0.33	0.021
0.3333	0.021
0.35	0.018
0.3666	0.015
0.3833	0.015
0.4	0.015
0.4166	0.012
0.4333	0.012
0.45	0.012
0.4666	0.009
0.4833	0.009
0.5	0.009
0.5166	0.009
0.5333	0.009
0.55	0.006
0.5666	0.009
0.5833	0.006
0.6	0.006
0.6166	0.006
0.6333	0.006
0.65	0.006
0.6666	0.006
0.6833	0.006
0.7	0.006
0.7166	0.006
0.7333	0.006
0.75	0.006
0.7666	0.006
0.7833	0.006
0.8	0.006
0.8166	0.006
0.8333	0.006
0.85	0.003
0.8666	0.006
0.8833	0.003
0.9	0.006
0.9166	0.003
0.9333	0.003
0.95	0.003
0.9666	0.003
0.9833	0.003
1	0.003
1.2	0
1.4	0.003
1.6	0.003
1.8	0.003
2	0.003
2.2	0
2.4	0.003
2.6	0
2.8	0
3	0
3.2	0
3.4	0.003
3.6	0.003
3.8	0
4	0
4.2	0
4.4	0
4.6	0
4.8	0
5	0
5.2	0

0.26	0.037
0.2633	0.034
0.2666	0.034
0.27	0.034
0.2733	0.034
0.2766	0.034
0.28	0.031
0.2833	0.031
0.2866	0.031
0.29	0.031
0.2933	0.031
0.2966	0.028
0.3	0.028
0.3033	0.028
0.3066	0.028
0.31	0.028
0.3133	0.028
0.3166	0.025
0.32	0.025
0.3233	0.025
0.3266	0.025
0.33	0.025
0.3333	0.025
0.35	0.022
0.3666	0.018
0.3833	0.018
0.4	0.018
0.4166	0.015
0.4333	0.015
0.45	0.015
0.4666	0.012
0.4833	0.012
0.5	0.012
0.5166	0.012
0.5333	0.009
0.55	0.009
0.5666	0.009
0.5833	0.009
0.6	0.009
0.6166	0.009
0.6333	0.009
0.65	0.009
0.6666	0.009
0.6833	0.006
0.7	0.006
0.7166	0.006
0.7333	0.009
0.75	0.006
0.7666	0.009
0.7833	0.006
0.8	0.009
0.8166	0.009
0.8333	0.006
0.85	0.006
0.8666	0.006
0.8833	0.006
0.9	0.006
0.9166	0.009
0.9333	0.009
0.95	0.006
0.9666	0.006
0.9833	0.006
1	0.006
1.2	0.006
1.4	0.006
1.6	0.006
1.8	0.006
2	0.006
2.2	0.006
2.4	0.006
2.6	0.006
2.8	0.006

5.4	0
5.6	0
5.8	0

PERMEABILITY TEST RESULTS FOR SHM-93-24A:

TEST 1

HVORSLEV:

0.02 CM/SEC

BOUWER AND RICE:

0.04 CM/SEC

TEST 2

HVORSLEV:

0.02 CM/SEC

BOUWER AND RICE:

0.04 CM/SEC

AQUIFER TESTING COMPLETION CHECKLIST

AQUIFER TEST NO. _____

SETUP	DATE	BY WHOM
MONITORING WELL ID	54M-93-24A	RUSTAD / ROKA
DATE OF TEST	4-01-93	
TYPE OF TEST	RISING HEAD	
HERMIT TYPE/SERIAL#	SE 1000C / 1K001732	
TEST #	SEL 7 10F2	
DATA COLLECTION RATE	LOG 000	
TRANSDUCER		
SERIAL #	2046 DE	
PSIG	10	
SCALE FACTOR	10.001	
OFFSET	-0.034	
INPUT CHANNEL	INP 1	
TEST DATA		
INPUT MODE (TOC/SUR)	TOC	
STATIC WATER LEVEL (FT./TOC)	15.42	
WELL DEPTH (FT./TOC)	23	
XD DEPTH (FT./TOC)	22	
INITIAL XD REFERENCE	9.51	
SLUG DEPTH (FT./TOC)	19.0	
TIME OF SLUG PLACEMENT	11:00	
TIME OF WL EQUILIBRATION	1101	
NEW XD REFERENCE	9.52	
START TIME OF TEST	1105	
END TIME OF TEST		
NOTES: LINEARITY 70.004		

FIGURE 4-14
AQUIFER TEST COMPLETION CHECKLIST
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

3' x 3" BAR STOCK AIR

AQUIFER TESTING COMPLETION CHECKLIST

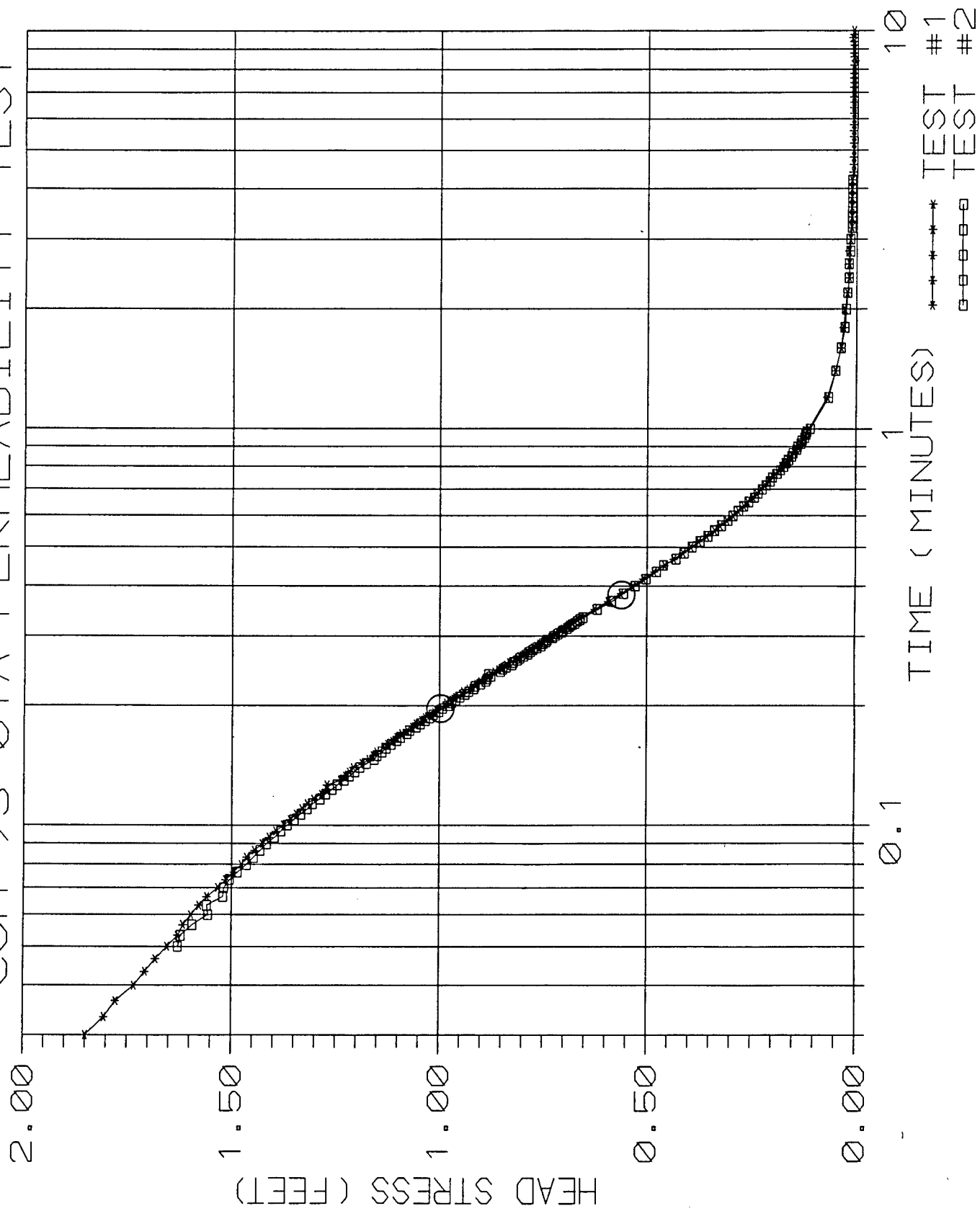
AQUIFER TEST NO. _____

SETUP	DATE	BY WHOM
MONITORING WELL ID	SHM.93.24A	RUSTAD / ROKA
DATE OF TEST	4.0.93	
TYPE OF TEST	RISEING HEAD	
HERMIT TYPE/SERIAL#	SE1000C / 1K001732	
TEST #	SEW 8 (20F2)	
DATA COLLECTION RATE	LOG 000	
TRANSDUCER		
SERIAL #	2046 SE	
PSIG	10	
SCALE FACTOR	10.001	
OFFSET	-0.034	
INPUT CHANNEL	INP 1	
TEST DATA		
INPUT MODE (TOC/SUR)	(10) 15.42 TOC	
STATIC WATER LEVEL (FT./TOC)	(22) 22.5.42	
WELL DEPTH (FT./TOC)	23' PVC	
XD DEPTH (FT./TOC)	22' PVC	
INITIAL XD REFERENCE	9.52	
SLUG DEPTH (FT./TOC)	19' PVC	
TIME OF SLUG PLACEMENT	1111	
TIME OF WL EQUILIBRATION	1112	
NEW XD REFERENCE	9.52	
START TIME OF TEST	1113	
END TIME OF TEST	1116	
NOTES:		

FIGURE 4-14
AQUIFER TEST COMPLETION CHECKLIST
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

3' x 3" Bar Stone PVC

CSM-93-01A PERMEABILITY TEST



CSM-93-01A

WELL RADIUS= 0.167 FT, SATURATED SCREEN LENGTH= 10 FT, BORING RADIUS= 0.208 FT

TEST 1	
MINUTES	FEET
0	0
0.0033	0.003
0.0066	0.041
0.01	0.923
0.0133	1.638
0.0166	0.616
0.02	0.563
0.0233	0.863
0.0266	1.543
0.03	1.85
0.0333	1.805
0.0366	1.777
0.04	1.733
0.0433	1.707
0.0466	1.682
0.05	1.654
0.0533	1.628
0.0566	1.616
0.06	1.597
0.0633	1.578
0.0666	1.559
0.07	1.533
0.0733	1.514
0.0766	1.495
0.08	1.477
0.0833	1.464
0.0866	1.445
0.09	1.426
0.0933	1.41
0.0966	1.394
0.1	1.375
0.1033	1.359
0.1066	1.344
0.11	1.331
0.1133	1.318
0.1166	1.303
0.12	1.284
0.1233	1.271
0.1266	1.271
0.13	1.239
0.1333	1.227
0.1366	1.217
0.14	1.208
0.1433	1.186
0.1466	1.17
0.15	1.16
0.1533	1.151
0.1566	1.132
0.16	1.125
0.1633	1.113
0.1666	1.103
0.17	1.091
0.1733	1.078
0.1766	1.065
0.18	1.056
0.1833	1.043
0.1866	1.034
0.19	1.021
0.1933	1.012
0.1966	1.002
0.2	0.989
0.2033	0.983
0.2066	0.97
0.21	0.961
0.2133	0.948
0.2166	0.942
0.22	0.929
0.2233	0.92
0.2266	0.91
0.23	0.901
0.2333	0.891
0.2366	0.882
0.24	0.876
0.2433	0.866
0.2466	0.857
0.25	0.847
0.2533	0.838
0.2566	0.831
0.26	0.819
0.2633	0.812
0.2666	0.806
0.27	0.796
0.2733	0.79
0.2766	0.781
0.28	0.774
0.2833	0.765
0.2866	0.759
0.29	0.749
0.2933	0.743
0.2966	0.73
0.3	0.73

TEST 2	
MINUTES	FEET
0	0.006
0.0033	0.012
0.0066	0.496
0.01	1.356
0.0133	1.227
0.0166	0.537
0.02	0.923
0.0233	1.303
0.0266	1.796
0.03	1.796
0.0333	1.755
0.0366	1.745
0.04	1.701
0.0433	1.698
0.0466	1.698
0.05	1.628
0.0533	1.622
0.0566	1.594
0.06	1.556
0.0633	1.559
0.0666	1.521
0.07	1.518
0.0733	1.505
0.0766	1.486
0.08	1.464
0.0833	1.448
0.0866	1.432
0.09	1.416
0.0933	1.397
0.0966	1.382
0.1	1.366
0.1033	1.35
0.1066	1.334
0.11	1.318
0.1133	1.306
0.1166	1.287
0.12	1.274
0.1233	1.258
0.1266	1.246
0.13	1.23
0.1333	1.217
0.1366	1.204
0.14	1.192
0.1433	1.176
0.1466	1.157
0.15	1.151
0.1533	1.138
0.1566	1.129
0.16	1.116
0.1633	1.103
0.1666	1.094
0.17	1.078
0.1733	1.072
0.1766	1.056
0.18	1.046
0.1833	1.034
0.1866	1.024
0.19	1.015
0.1933	1.002
0.1966	0.993
0.2	0.98
0.2033	0.97
0.2066	0.961
0.21	0.951
0.2133	0.939
0.2166	0.929
0.22	0.917
0.2233	0.914
0.2266	0.901
0.23	0.888
0.2333	0.885
0.2366	0.876
0.24	0.882
0.2433	0.853
0.2466	0.847
0.25	0.838
0.2533	0.825
0.2566	0.822
0.26	0.812
0.2633	0.806
0.2666	0.796
0.27	0.787
0.2733	0.781
0.2766	0.774
0.28	0.765
0.2833	0.755
0.2866	0.749
0.29	0.743
0.2933	0.74
0.2966	0.727
0.3	0.721

0.3033	0.721
0.3066	0.714
0.31	0.708
0.3133	0.702
0.3166	0.692
0.32	0.689
0.3233	0.679
0.3266	0.673
0.33	0.667
0.3333	0.66
0.35	0.626
0.3666	0.594
0.3833	0.563
0.4	0.534
0.4166	0.509
0.4333	0.483
0.45	0.458
0.4666	0.436
0.4833	0.414
0.5	0.395
0.5166	0.376
0.5333	0.357
0.55	0.338
0.5666	0.325
0.5833	0.309
0.6	0.294
0.6166	0.281
0.6333	0.268
0.65	0.259
0.6666	0.246
0.6833	0.237
0.7	0.227
0.7166	0.218
0.7333	0.208
0.75	0.199
0.7666	0.192
0.7833	0.183
0.8	0.177
0.8166	0.17
0.8333	0.161
0.85	0.158
0.8666	0.148
0.8833	0.142
0.9	0.139
0.9166	0.132
0.9333	0.129
0.95	0.123
0.9666	0.12
0.9833	0.117
1	0.113
1.2	0.069
1.4	0.05
1.6	0.037
1.8	0.031
2	0.028
2.2	0.022
2.4	0.018
2.6	0.018
2.8	0.018
3	0.015
3.2	0.012
3.4	0.012
3.6	0.012
3.8	0.012
4	0.012
4.2	0.012
4.4	0.009
4.6	0.009
4.8	0.009
5	0.009
5.2	0.009
5.4	0.009
5.6	0.009
5.8	0.009
6	0.009
6.2	0.009
6.4	0.009
6.6	0.009
6.8	0.009
7	0.009
7.2	0.009
7.4	0.009
7.6	0.009
7.8	0.009
8	0.009
8.2	0.009
8.4	0.006
8.6	0.009
8.8	0.009
9	0.009
9.2	0.009
9.4	0.009
9.6	0.012
9.8	0.009
10	0.009

0.3033	0.714
0.3066	0.705
0.31	0.702
0.3133	0.692
0.3166	0.686
0.32	0.679
0.3233	0.673
0.3266	0.667
0.33	0.66
0.3333	0.654
0.35	0.619
0.3666	0.585
0.3833	0.556
0.4	0.528
0.4166	0.502
0.4333	0.477
0.45	0.461
0.4666	0.43
0.4833	0.411
0.5	0.392
0.5166	0.373
0.5333	0.354
0.55	0.338
0.5666	0.322
0.5833	0.306
0.6	0.294
0.6166	0.281
0.6333	0.268
0.65	0.256
0.6666	0.243
0.6833	0.234
0.7	0.224
0.7166	0.215
0.7333	0.205
0.75	0.199
0.7666	0.189
0.7833	0.18
0.8	0.173
0.8166	0.167
0.8333	0.161
0.85	0.154
0.8666	0.151
0.8833	0.142
0.9	0.139
0.9166	0.132
0.9333	0.129
0.95	0.123
0.9666	0.12
0.9833	0.117
1	0.11
1.2	0.066
1.4	0.05
1.6	0.037
1.8	0.028
2	0.025
2.2	0.022
2.4	0.018
2.6	0.018
2.8	0.015
3	0.015
3.2	0.012
3.4	0.012
3.6	0.012
3.8	0.012
4	0.012
4.2	0.012

PERMEABILITY TEST RESULTS FO CSM-93-01A:

TEST 1

HVORSLEV:

0.0005 CM/SEC

BOUWER AND RICE:

0.005 CM/SEC

TEST 2

HVORSLEV:

0.0005 CM/SEC

BOUWER AND RICE:

0.007 CM/SEC

AQUIFER TESTING COMPLETION CHECKLIST

AQUIFER TEST NO. _____

SETUP	DATE	BY WHOM
MONITORING WELL ID	CSM-93-01A SHM-93	RUSTAD/ROSA
DATE OF TEST	4-01-93	
TYPE OF TEST	RISING HEAD	
HERMIT TYPE/SERIAL#	SE1000C / 1K01732	
TEST #	SEL 9 / 10F2	
DATA COLLECTION RATE	LOG 000	
TRANSDUCER		
SERIAL #	2046 DE	
PSIG	10	
SCALE FACTOR	10.001	
OFFSET	-0.034	
INPUT CHANNEL	INP # 1	
TEST DATA		
INPUT MODE (TOC/SUR)	TOC	
STATIC WATER LEVEL (FT./TOC)	15.99	
WELL DEPTH (FT./TOC)	65.00'	
XD DEPTH (FT./TOC)	20.00 26.00	
INITIAL XD REFERENCE	10.63	
SLUG DEPTH (FT./TOC)	20.00	
TIME OF SLUG PLACEMENT	1155	
TIME OF WL EQUILIBRATION	1200	
NEW XD REFERENCE	40.65	
START TIME OF TEST	1205	
END TIME OF TEST	1212	
NOTES:		

3' x 3" Bor Stock PVC

FIGURE 4-14
AQUIFER TEST COMPLETION CHECKLIST
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

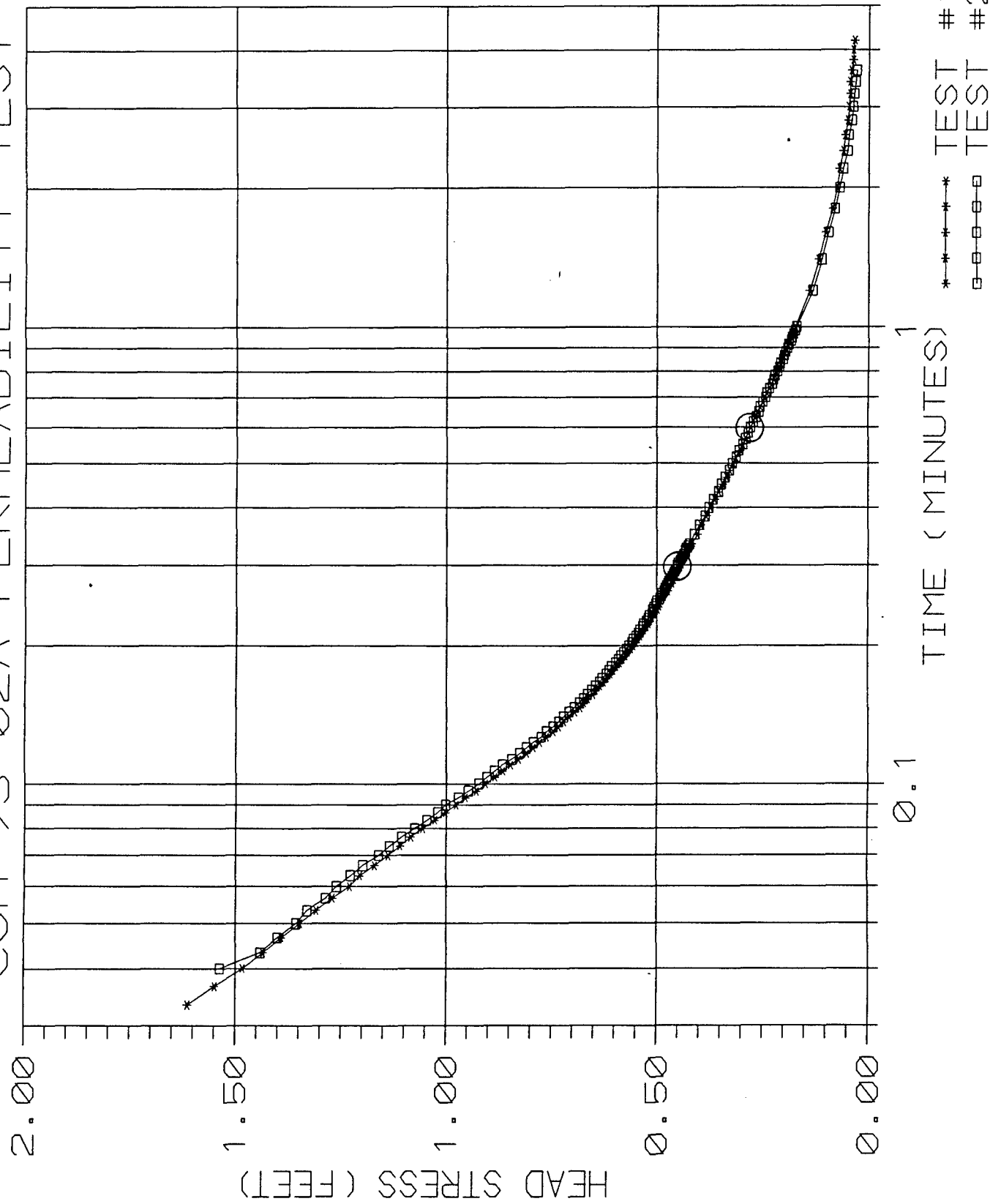
AQUIFER TESTING COMPLETION CHECKLIST

AQUIFER TEST NO. _____

SETUP	DATE	BY WHOM
MONITORING WELL ID	CSM.93.01A	RUSTAN / ROKA
DATE OF TEST	4.01.93	
TYPE OF TEST	RISING HEAD	
HERMIT TYPE/SERIAL#	SE 1000 C / 1KCD732	
TEST #	SEL 10	
DATA COLLECTION RATE	Low 000	
TRANSDUCER		
SERIAL #	2046 DE	
PSIG	10	
SCALE FACTOR	10.001	
OFFSET	- 0.034	
INPUT CHANNEL	INP 1	
TEST DATA		
INPUT MODE (TOC/SUR)	TOC	
STATIC WATER LEVEL (FT./TOC)	15.97	
WELL DEPTH (FT./TOC)	65'	
XD DEPTH (FT./TOC)	20.00	
INITIAL XD REFERENCE	10.43	
SLUG DEPTH (FT./TOC)	20.00	
TIME OF SLUG PLACEMENT	1213	
TIME OF WL EQUILIBRATION	1215	
NEW XD REFERENCE	10.65	
START TIME OF TEST	1216	
END TIME OF TEST	1220	
NOTES: All meas. from PVC		

FIGURE 4-14
AQUIFER TEST COMPLETION CHECKLIST
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

CSM-93-02A PERMEABILITY TEST



CSM-93-02A

WELL RADIUS= 0.167 FT, SATURATED SCREEN LENGTH= 7.4 FT, BORING RAI

TEST 1		TEST 2	
MINUTES	FEET	MINUTES	FEET
0	0.003	0	0.452
0.0033	0.8	0.0033	0.971
0.0066	1.037	0.0066	1.031
0.01	1.04	0.01	0.272
0.0133	0.679	0.0133	0.433
0.0166	0.461	0.0166	0.872
0.02	0.872	0.02	0.43
0.0233	0.158	0.0233	0.303
0.0266	1.04	0.0266	1.075
0.03	1.233	0.03	1.084
0.0333	1.613	0.0333	1.388
0.0366	1.549	0.0366	1.533
0.04	1.483	0.04	1.537
0.0433	1.435	0.0433	1.442
0.0466	1.391	0.0466	1.401
0.05	1.347	0.05	1.356
0.0533	1.309	0.0533	1.331
0.0566	1.271	0.0566	1.287
0.06	1.23	0.06	1.261
0.0633	1.205	0.0633	1.227
0.0666	1.17	0.0666	1.198
0.07	1.138	0.07	1.16
0.0733	1.11	0.0733	1.135
0.0766	1.084	0.0766	1.106
0.08	1.056	0.08	1.075
0.0833	1.027	0.0833	1.046
0.0866	1.002	0.0866	1.021
0.09	0.977	0.09	1.002
0.0933	0.955	0.0933	0.971
0.0966	0.929	0.0966	0.948
0.1	0.907	0.1	0.923
0.1033	0.885	0.1033	0.904
0.1066	0.866	0.1066	0.885
0.11	0.847	0.11	0.866
0.1133	0.828	0.1133	0.844
0.1166	0.809	0.1166	0.825
0.12	0.793	0.12	0.809
0.1233	0.778	0.1233	0.793
0.1266	0.762	0.1266	0.774
0.13	0.746	0.13	0.762
0.1333	0.733	0.1333	0.746
0.1366	0.721	0.1366	0.733
0.14	0.708	0.14	0.721
0.1433	0.695	0.1433	0.708
0.1466	0.683	0.1466	0.695
0.15	0.673	0.15	0.683
0.1533	0.664	0.1533	0.673
0.1566	0.651	0.1566	0.664
0.16	0.645	0.16	0.654
0.1633	0.635	0.1633	0.645
0.1666	0.626	0.1666	0.635
0.17	0.619	0.17	0.629
0.1733	0.61	0.1733	0.619
0.1766	0.604	0.1766	0.613
0.18	0.597	0.18	0.607
0.1833	0.588	0.1833	0.597
0.1866	0.581	0.1866	0.591
0.19	0.575	0.19	0.585
0.1933	0.569	0.1933	0.578
0.1966	0.562	0.1966	0.572
0.2	0.556	0.2	0.566
0.2033	0.55	0.2033	0.559
0.2066	0.547	0.2066	0.556
0.21	0.54	0.21	0.55
0.2133	0.537	0.2133	0.544
0.2166	0.531	0.2166	0.54
0.22	0.525	0.22	0.534
0.2233	0.521	0.2233	0.531
0.2266	0.518	0.2266	0.525
0.23	0.512	0.23	0.521
0.2333	0.509	0.2333	0.518
0.2366	0.506	0.2366	0.512
0.24	0.499	0.24	0.509
0.2433	0.496	0.2433	0.506
0.2466	0.493	0.2466	0.502
0.25	0.49	0.25	0.499
0.2533	0.487	0.2533	0.493
0.2566	0.483	0.2566	0.49

0.26	0.48
0.2633	0.474
0.2666	0.474
0.27	0.471
0.2733	0.464
0.2766	0.464
0.28	0.461
0.2833	0.458
0.2866	0.455
0.29	0.452
0.2933	0.449
0.2966	0.445
0.3	0.442
0.3033	0.442
0.3066	0.439
0.31	0.436
0.3133	0.433
0.3166	0.43
0.32	0.426
0.3233	0.426
0.3266	0.423
0.33	0.42
0.3333	0.417
0.35	0.404
0.3666	0.395
0.3833	0.382
0.4	0.373
0.4166	0.363
0.4333	0.354
0.45	0.344
0.4666	0.335
0.4833	0.328
0.5	0.319
0.5166	0.313
0.5333	0.303
0.55	0.297
0.5666	0.29
0.5833	0.284
0.6	0.278
0.6166	0.272
0.6333	0.268
0.65	0.262
0.6666	0.256
0.6833	0.249
0.7	0.246
0.7166	0.24
0.7333	0.234
0.75	0.23
0.7666	0.224
0.7833	0.221
0.8	0.218
0.8166	0.211
0.8333	0.208
0.85	0.205
0.8666	0.202
0.8833	0.199
0.9	0.196
0.9166	0.192
0.9333	0.186
0.95	0.183
0.9666	0.18
0.9833	0.177
1	0.173
1.2	0.139
1.4	0.117
1.6	0.101
1.8	0.085
2	0.075
2.2	0.069
2.4	0.06
2.6	0.056
2.8	0.05
3	0.047
3.2	0.044
3.4	0.044
3.6	0.041
3.8	0.037
4	0.037
4.2	0.034

0.26	0.487
0.2633	0.483
0.2666	0.48
0.27	0.477
0.2733	0.474
0.2766	0.471
0.28	0.468
0.2833	0.464
0.2866	0.461
0.29	0.458
0.2933	0.455
0.2966	0.452
0.3	0.452
0.3033	0.449
0.3066	0.445
0.31	0.442
0.3133	0.439
0.3166	0.436
0.32	0.433
0.3233	0.433
0.3266	0.43
0.33	0.426
0.3333	0.423
0.35	0.411
0.3666	0.398
0.3833	0.385
0.4	0.376
0.4166	0.366
0.4333	0.354
0.45	0.347
0.4666	0.338
0.4833	0.328
0.5	0.322
0.5166	0.313
0.5333	0.306
0.55	0.297
0.5666	0.29
0.5833	0.284
0.6	0.278
0.6166	0.272
0.6333	0.265
0.65	0.259
0.6666	0.256
0.6833	0.249
0.7	0.243
0.7166	0.24
0.7333	0.234
0.75	0.227
0.7666	0.224
0.7833	0.221
0.8	0.215
0.8166	0.211
0.8333	0.208
0.85	0.202
0.8666	0.199
0.8833	0.196
0.9	0.192
0.9166	0.189
0.9333	0.183
0.95	0.18
0.9666	0.177
0.9833	0.173
1	0.17
1.2	0.132
1.4	0.11
1.6	0.094
1.8	0.079
2	0.069
2.2	0.06
2.4	0.05
2.6	0.047
2.8	0.041
3	0.037
3.2	0.034
3.4	0.031
3.6	0.028

PERMEABILITY TEST RESULTS FOR CSM-93-02A:

TEST 1
HVORSLEV:
0.0008 CM/SEC

TEST 2
HVORSLEV:
0.0008 CM/SEC

CSM-93-02A

BOUWER AND RICE:
0.002 CM/SEC

BOUWER AND RICE:
0.002 CM/SEC

AQUIFER TESTING COMPLETION CHECKLIST

AQUIFER TEST NO. _____

SETUP	DATE	BY WHOM
MONITORING WELL ID	CSM-93-02A	RUSTAD / ROKA
DATE OF TEST	4-01-93	
TYPE OF TEST	RISING HEAD	
HERMIT TYPE/SERIAL#	SEL 13 (10FZ)	
TEST #	SE1000C / KCO1732	
DATA COLLECTION RATE	LOG 000	
TRANSDUCER		
SERIAL #	2046 SE	
PSIG	10	
SCALE FACTOR	10.001	
OFFSET	-0.034	
INPUT CHANNEL	# 1	
TEST DATA		
INPUT MODE (TOC/SUR)		
STATIC WATER LEVEL (FT./TOC)	24.64	
WELL DEPTH (FT./TOC)	32.00	
XD DEPTH (FT./TOC)	31.00	
INITIAL XD REFERENCE	8.51	
SLUG DEPTH (FT./TOC)	29.00	
TIME OF SLUG PLACEMENT	1335	
TIME OF WL EQUILIBRATION	1338	
NEW XD REFERENCE	8.54	
START TIME OF TEST	1339	
END TIME OF TEST		
NOTES:		

FIGURE 4-14
 AQUIFER TEST COMPLETION CHECKLIST
 PROJECT OPERATIONS PLAN
 FORT DEVENS, MASSACHUSETTS
 ABB Environmental Services, Inc.

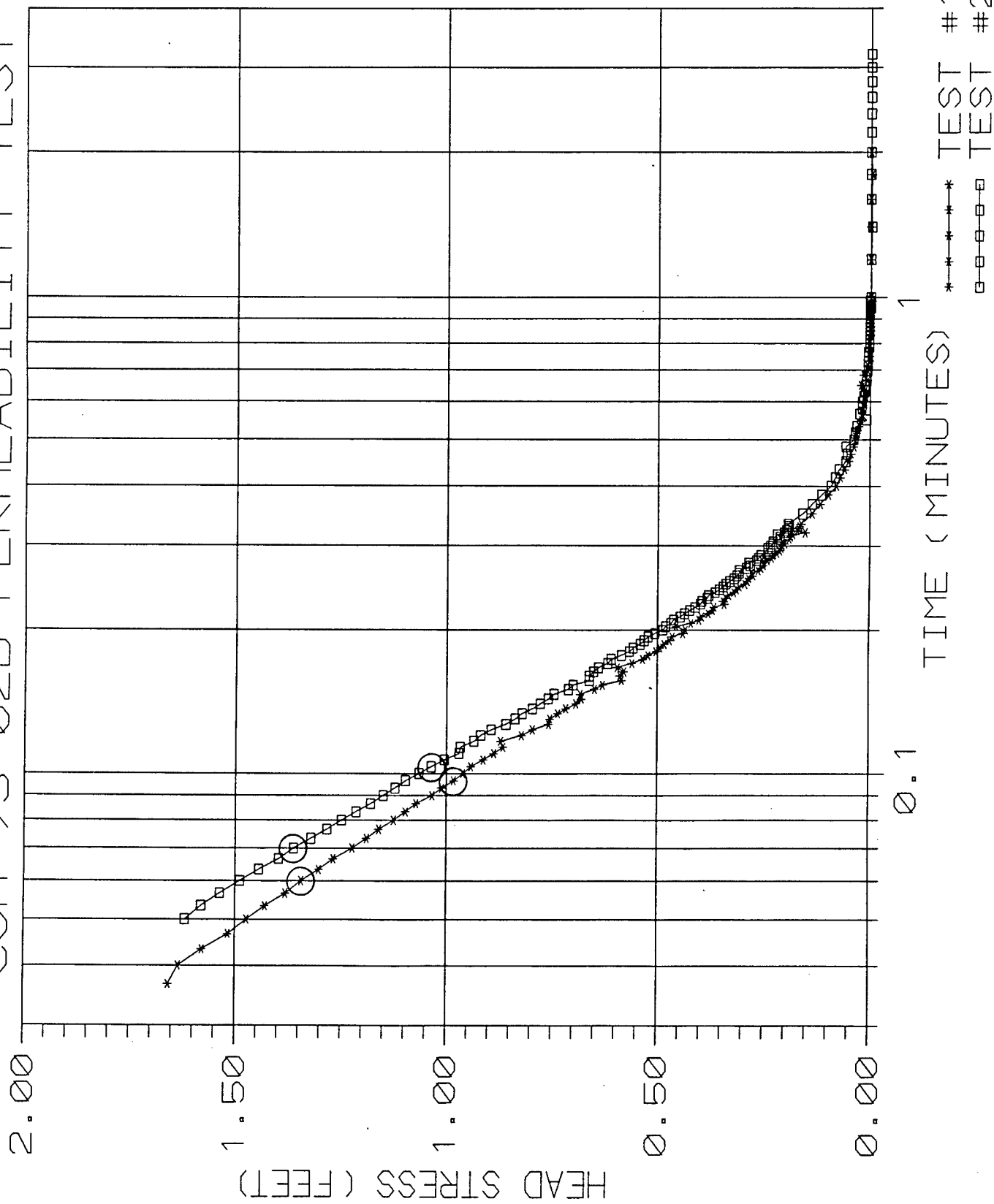
AQUIFER TESTING COMPLETION CHECKLIST

AQUIFER TEST NO. _____

SETUP	DATE	BY WHOM
MONITORING WELL ID	CSM-93-02A	RUSTAD / ROKA
DATE OF TEST	4.01.93	
TYPE OF TEST	Rising head	
HERMIT TYPE/SERIAL#	SEL 14 (2 of 2)	
TEST #	SE1000C / IRC 01732	
DATA COLLECTION RATE	Log 000	
TRANSDUCER		
SERIAL #	2046DE	
PSIG	10	
SCALE FACTOR	10.001	
OFFSET	-0.054	
INPUT CHANNEL	# 1	
TEST DATA		
INPUT MODE (TOC/SUR)	EnToc	
STATIC WATER LEVEL (FT./TOC)	24.64	
WELL DEPTH (FT./TOC)	32.00	
XD DEPTH (FT.TOC)	31.00	
INITIAL XD REFERENCE	8.54	
SLUG DEPTH (FT./TOC)	29.00	
TIME OF SLUG PLACEMENT	1345	
TIME OF WL EQUILIBRATION	1347	
NEW XD REFERENCE	8.54	
START TIME OF TEST	1352	
END TIME OF TEST		
NOTES:		

FIGURE 4-14
 AQUIFER TEST COMPLETION CHECKLIST
 PROJECT OPERATIONS PLAN
 FORT DEVENS, MASSACHUSETTS
 ABB Environmental Services, Inc.

CSM-93-02B PERMEABILITY TEST



CSM-93-02B

WELL RADIUS= 0.167 FT, SATURATED SCREEN LENGTH= 10 FT, BORING RADIUS= 0.417 FT

TEST 1	
MINUTES	FEET
0	0
0.0033	0.389
0.0066	1.144
0.01	0.68
0.0133	0.472
0.0166	1.087
0.02	0.69
0.0233	0.787
0.0266	0.803
0.03	1.381
0.0333	1.66
0.0366	1.657
0.04	1.634
0.0433	1.578
0.0466	1.517
0.05	1.473
0.0533	1.429
0.0566	1.381
0.06	1.344
0.0633	1.302
0.0666	1.268
0.07	1.223
0.0733	1.189
0.0766	1.16
0.08	1.125
0.0833	1.097
0.0866	1.072
0.09	1.034
0.0933	1.011
0.0966	0.983
0.1	0.961
0.1033	0.942
0.1066	0.913
0.11	0.888
0.1133	0.866
0.1166	0.872
0.12	0.822
0.1233	0.796
0.1266	0.758
0.13	0.755
0.1333	0.736
0.1366	0.717
0.14	0.693
0.1433	0.68
0.1466	0.683
0.15	0.649
0.1533	0.63
0.1566	0.585
0.16	0.589
0.1633	0.579
0.1666	0.595
0.17	0.56
0.1733	0.535
0.1766	0.522
0.18	0.503
0.1833	0.494
0.1866	0.484
0.19	0.472
0.1933	0.465
0.1966	0.44
0.2	0.434
0.2033	0.456
0.2066	0.421
0.21	0.402
0.2133	0.396
0.2166	0.38
0.22	0.37
0.2233	0.367
0.2266	0.342
0.23	0.345
0.2333	0.339
0.2366	0.332
0.24	0.32
0.2433	0.313
0.2466	0.307
0.25	0.294
0.2533	0.288
0.2566	0.285

TEST 2	
MINUTES	FEET
0	0.281
0.0033	0.774
0.0066	0.424
0.01	0.06
0.0133	0.348
0.0166	0.398
0.02	0.348
0.0233	0.338
0.0266	0.345
0.03	0.411
0.0333	0.601
0.0366	1.021
0.04	1.334
0.0433	1.438
0.0466	1.59
0.05	1.618
0.0533	1.58
0.0566	1.536
0.06	1.489
0.0633	1.444
0.0666	1.397
0.07	1.362
0.0733	1.321
0.0766	1.283
0.08	1.248
0.0833	1.214
0.0866	1.179
0.09	1.15
0.0933	1.122
0.0966	1.097
0.1	1.065
0.1033	1.036
0.1066	1.005
0.11	0.97
0.1133	0.967
0.1166	0.935
0.12	0.919
0.1233	0.894
0.1266	0.859
0.13	0.837
0.1333	0.821
0.1366	0.796
0.14	0.777
0.1433	0.758
0.1466	0.745
0.15	0.711
0.1533	0.699
0.1566	0.661
0.16	0.661
0.1633	0.651
0.1666	0.639
0.17	0.617
0.1733	0.61
0.1766	0.585
0.18	0.566
0.1833	0.557
0.1866	0.541
0.19	0.531
0.1933	0.522
0.1966	0.506
0.2	0.487
0.2033	0.481
0.2066	0.468
0.21	0.462
0.2133	0.446
0.2166	0.436
0.22	0.424
0.2233	0.411
0.2266	0.398
0.23	0.395
0.2333	0.383
0.2366	0.379
0.24	0.364
0.2433	0.354
0.2466	0.345
0.25	0.338
0.2533	0.329
0.2566	0.319

CSM-93-02B

0.26	0.275
0.2633	0.279
0.2666	0.263
0.27	0.256
0.2733	0.25
0.2766	0.25
0.28	0.241
0.2833	0.231
0.2866	0.228
0.29	0.219
0.2933	0.212
0.2966	0.209
0.3	0.206
0.3033	0.2
0.3066	0.206
0.31	0.19
0.3133	0.187
0.3166	0.181
0.32	0.152
0.3233	0.171
0.3266	0.168
0.33	0.165
0.3333	0.162
0.35	0.136
0.3666	0.117
0.3833	0.098
0.4	0.079
0.4166	0.07
0.4333	0.06
0.45	0.051
0.4666	0.045
0.4833	0.038
0.5	0.035
0.5166	0.032
0.5333	0.026
0.55	0.022
0.5666	0.019
0.5833	0.016
0.6	0.013
0.6166	0.013
0.6333	0.013
0.65	0.022
0.6666	0.007
0.6833	0.016
0.7	0.007
0.7166	0.007
0.7333	0.003
0.75	0.003
0.7666	0.003
0.7833	0.003
0.8	0.003
0.8166	0.003
0.8333	0
0.85	0
0.8666	0
0.8833	0
0.9	0
0.9166	0
0.9333	0
0.95	0
0.9666	0
0.9833	-0.003
1	0
1.2	0
1.4	0
1.6	0
1.8	-0.003
2	0

0.26	0.313
0.2633	0.307
0.2666	0.307
0.27	0.291
0.2733	0.281
0.2766	0.285
0.28	0.266
0.2833	0.262
0.2866	0.256
0.29	0.24
0.2933	0.24
0.2966	0.24
0.3	0.234
0.3033	0.228
0.3066	0.228
0.31	0.212
0.3133	0.212
0.3166	0.218
0.32	0.202
0.3233	0.196
0.3266	0.193
0.33	0.19
0.3333	0.193
0.35	0.158
0.3666	0.136
0.3833	0.114
0.4	0.092
0.4166	0.082
0.4333	0.073
0.45	0.057
0.4666	0.054
0.4833	0.057
0.5	0.038
0.5166	0.035
0.5333	0.032
0.55	0.009
0.5666	0.025
0.5833	0.019
0.6	0.019
0.6166	0.016
0.6333	0.013
0.65	0.013
0.6666	0.009
0.6833	0.009
0.7	0.006
0.7166	0.006
0.7333	0.006
0.75	0.006
0.7666	0.006
0.7833	0.003
0.8	0.003
0.8166	0.003
0.8333	0.003
0.85	0.003
0.8666	0.003
0.8833	0.003
0.9	0.003
0.9166	0.003
0.9333	0.003
0.95	0
0.9666	0.003
0.9833	0.003
1	0
1.2	0
1.4	-0.003
1.6	0
1.8	0
2	0
2.2	0
2.4	0
2.6	0
2.8	0
3	0
3.2	0

PERMEABILITY TEST RESULTS FOR CSM-93-02B:

TEST 1
HVORSLEV:
0.001 CM/SEC
BOUWER AND RICE:
0.01 CM/SEC

TEST 2
HVORSLEV:
0.001 CM/SEC
BOUWER AND RICE:
0.01 CM/SEC

CSM-93-02B

AQUIFER TESTING COMPLETION CHECKLIST

AQUIFER TEST NO. _____

SETUP	DATE	BY WHOM
MONITORING WELL ID	CSM.93.022	RUSTAD / POICA
DATE OF TEST	4.01.93	
TYPE OF TEST	RISING HEAD	
HERMIT TYPE/SERIAL#	SE 1000C / 1101232	
TEST #	SEL 11 / 10F2	
DATA COLLECTION RATE	LOG 000	
TRANSDUCER		
SERIAL #	20462	
PSIG	10	
SCALE FACTOR	10.001	
OFFSET	-0.034	
INPUT CHANNEL	IND 1	
TEST DATA		
INPUT MODE (TOC/SUR)	TOC	
STATIC WATER LEVEL (FT./TOC)	24.42	
WELL DEPTH (FT./TOC)	68.00	
XD DEPTH (FT.TOC)	35.00	
INITIAL XD REFERENCE	11.35	
SLUG DEPTH (FT./TOC)	30.00	
TIME OF SLUG PLACEMENT	13.11	
TIME OF WL EQUILIBRATION	13.12	
NEW XD REFERENCE	11.35	
START TIME OF TEST	1315	
END TIME OF TEST	1317	
NOTES:	All DEPTUS to From PVC	

FIGURE 4-14
AQUIFER TEST COMPLETION CHECKLIST
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

AQUIFER TESTING COMPLETION CHECKLIST

AQUIFER TEST NO. _____

SETUP	DATE	BY WHOM
MONITORING WELL ID	CSM-93-023	RUSTAD / ROCA
DATE OF TEST	4-01-93	
TYPE OF TEST	RISING HEAD	
HERMIT TYPE/SERIAL#	SE 1000C / IKC0732	
TEST #	SEL 12 (2012)	
DATA COLLECTION RATE	LOG 000	
TRANSDUCER		
SERIAL #	2046 DE	
PSIG	10	
SCALE FACTOR	10.001	
OFFSET	-0.034	
INPUT CHANNEL	IND 1	
TEST DATA		
INPUT MODE (TOC/SUR)	TOC	
STATIC WATER LEVEL (FT./TOC)	24.42	
WELL DEPTH (FT./TOC)	68.00	
XD DEPTH (FT./TOC)	35.00	
INITIAL XD REFERENCE	11.35	
SLUG DEPTH (FT./TOC)	30.00	
TIME OF SLUG PLACEMENT	13:18	
TIME OF WL EQUILIBRATION	13/9	
NEW XD REFERENCE	11.36	
START TIME OF TEST	1320	
END TIME OF TEST		
NOTES:		

FIGURE 4-14
AQUIFER TEST COMPLETION CHECKLIST
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

CALCULATION OF HYDRAULIC CONDUCTIVITIES USING THE HVORSLEV EQUATION GROUP 3 WELLS

$$K = -\frac{1}{2} \frac{[(\log Ht1 - \log Ht2) / (t1 - t2)]}{\{[(r) \sim 2 \log (L/R)] / 2L\}}$$

WHERE:

t1 = TIME 1 (MINUTES)

t2 = TIME 2 (MINUTES)

Ht1 = HEAD STRESS AT TIME 1 (FEET)

Ht2 = HEAD STRESS AT TIME 2 (FEET)

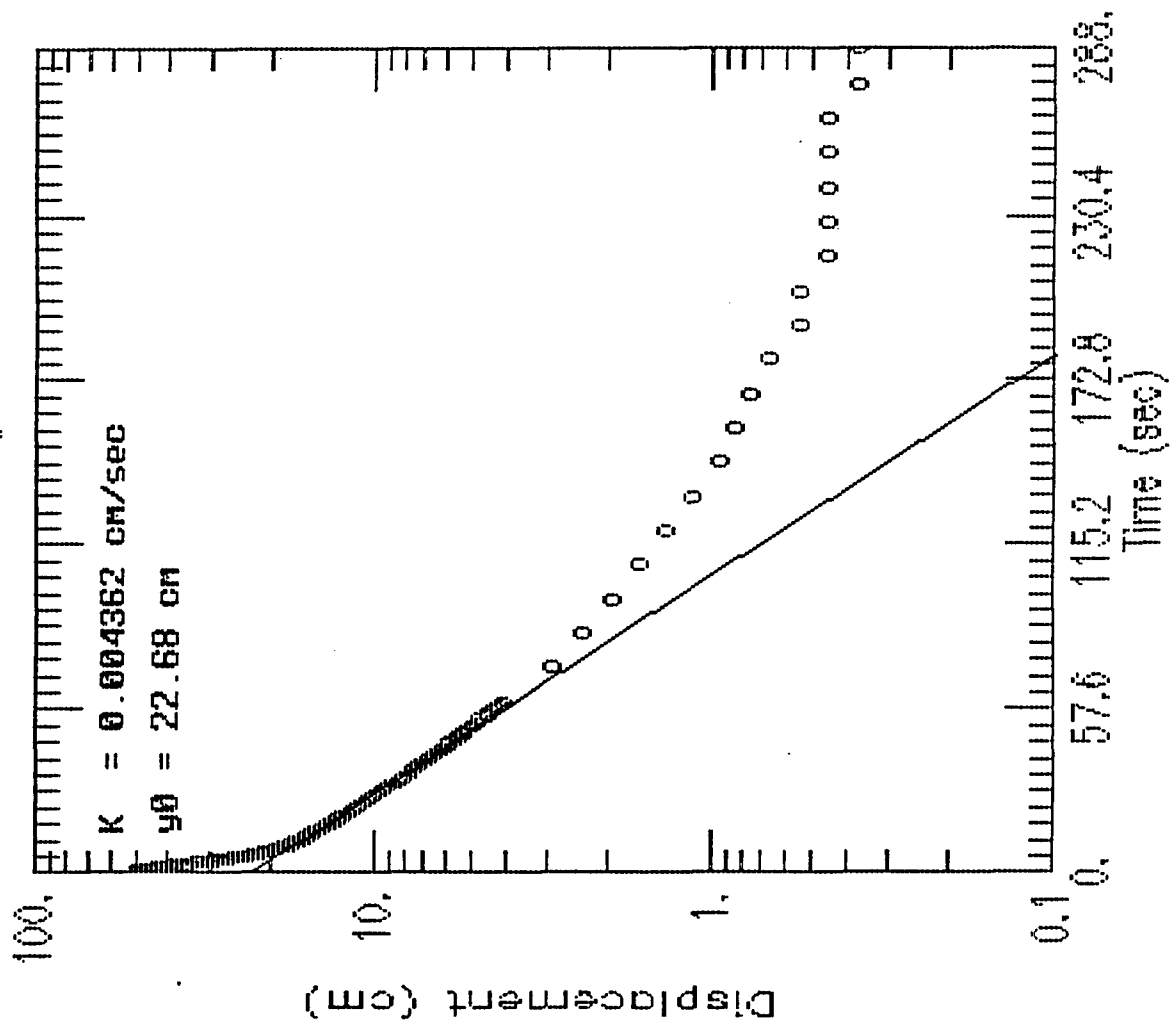
r = RADIUS OF WELL CASING (FEET)

R = RADIUS OF BOREHOLE (FEET)

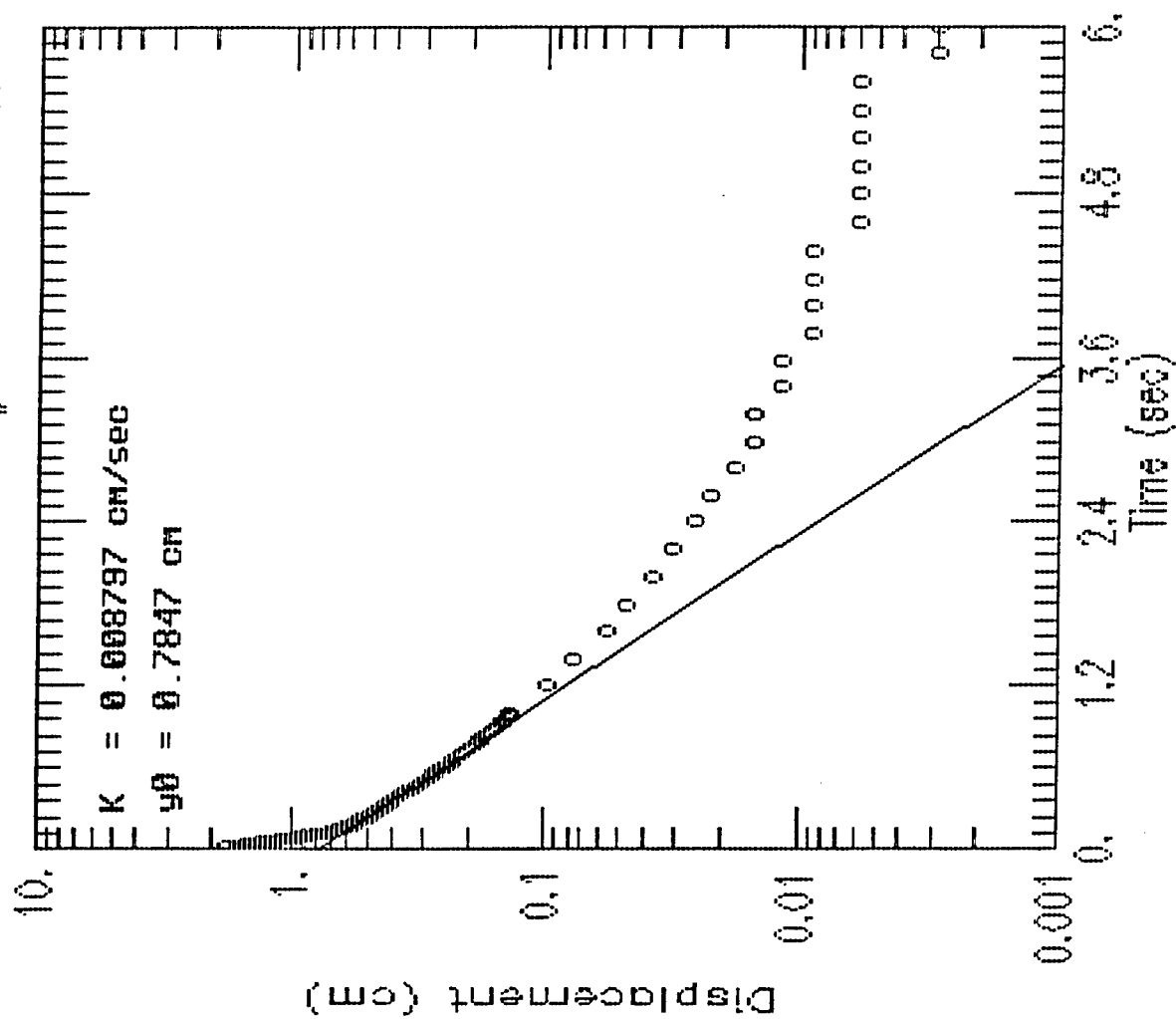
L = EFFECTIVE SATURATED LENGTH OF SCREEN (FEET)

WELL	t1	t2	Ht1	Ht2	r	R	L	TEST #	K (FT/MIN)	K (CM/SEC)
SHM-93-01A	0.3	0.7	0.435	0.214	0.167	0.417	4.3	1	2.5E-03	1.3E-03
SHM-93-01A	0.3	0.7	0.451	0.214	0.167	0.417	4.3	2	2.7E-03	1.4E-03
SHM-93-10C	8	18	0.947	0.47	0.167	0.234	15	1	5.1E-05	2.6E-05
SHM-93-10C	6	14	1.019	0.524	0.167	0.234	15	2	6.1E-05	3.1E-05
SHM-93-18B	0.35	0.85	1.016	0.436	0.167	0.417	15	1	1.1E-03	5.4E-04
SHM-93-18B	0.35	0.85	1.013	0.435	0.167	0.417	15	2	1.1E-03	5.4E-04
SHM-93-22C	100	180	2.258	2.03	0.167	0.234	15	1	9.7E-07	4.9E-07
SHM-93-24A	0.05	0.066	0.593	0.356	0.167	0.417	7.6	1	3.2E-02	1.6E-02
SHM-93-24A	0.06	0.08	0.752	0.398	0.167	0.417	7.6	2	3.2E-02	1.6E-02
CSM-93-01A	0.2	0.383	0.989	0.563	0.167	0.208	49	1	9.0E-04	4.6E-04
CSM-93-01A	0.2	0.383	0.98	0.556	0.167	0.208	49	2	9.1E-04	4.6E-04
CSM-93-02A	0.3	0.6	0.442	0.278	0.167	0.417	7.4	1	1.6E-03	8.0E-04
CSM-93-02A	0.3	0.6	0.452	0.278	0.167	0.417	7.4	2	1.7E-03	8.4E-04
CSM-93-02B	0.06	0.096	1.344	0.983	0.167	0.417	15	1	5.5E-03	2.8E-03
CSM-93-02B	0.07	0.103	1.362	1.036	0.167	0.417	15	2	5.2E-03	2.6E-03

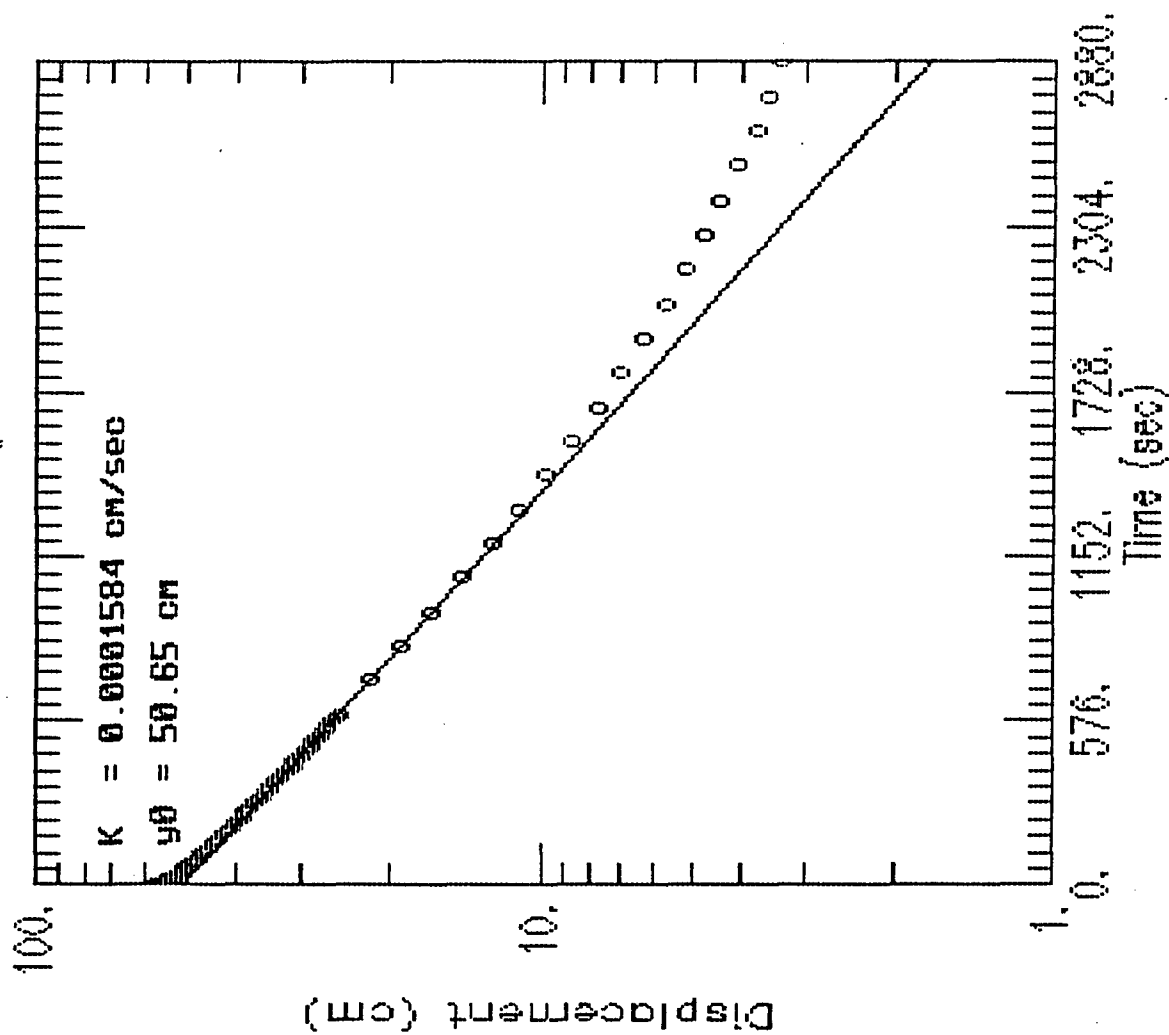
PERMEABILITY TEST #1 SHM-93-01A



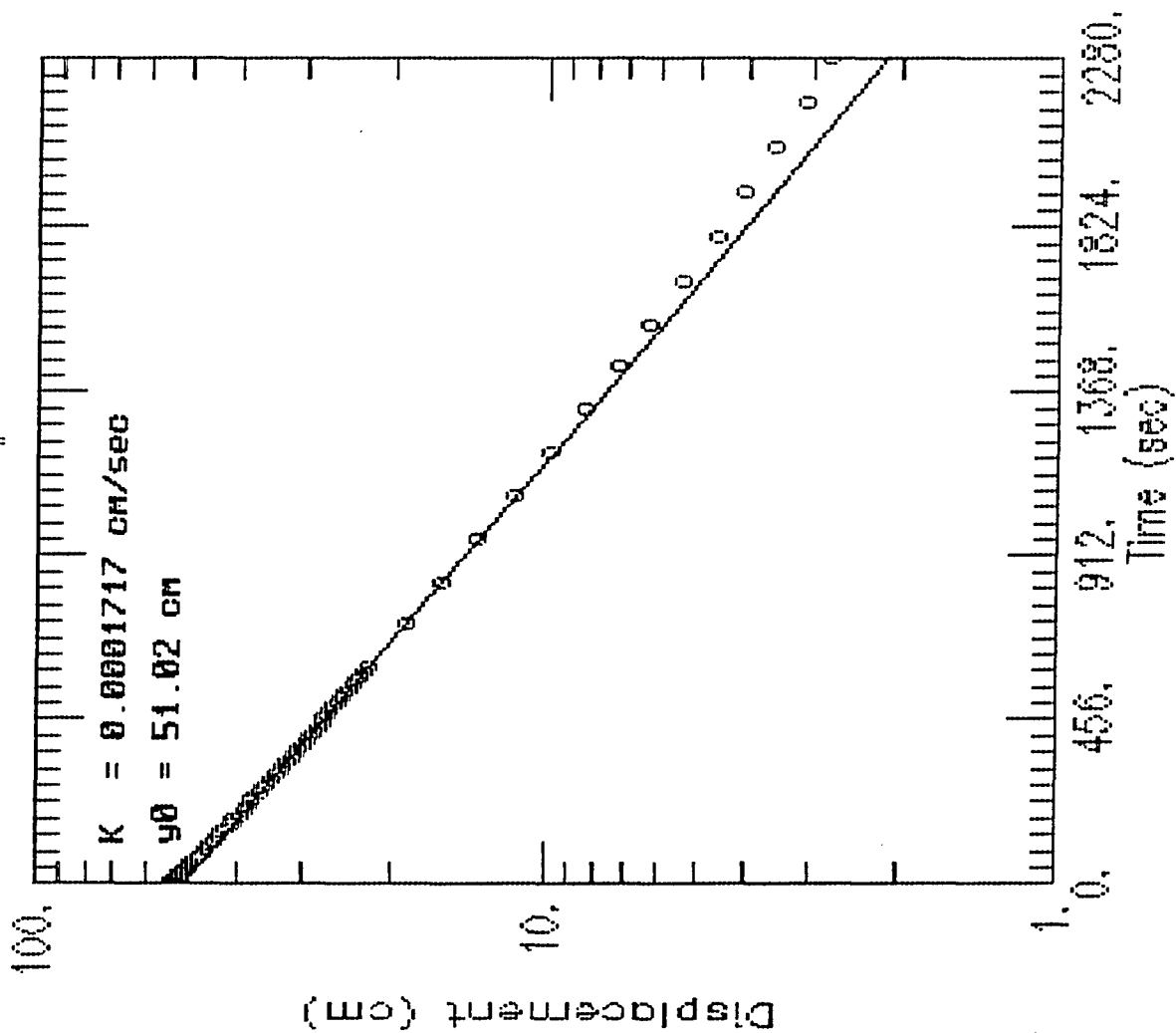
PERMEABILITY TEST #2 SHM-93-01A



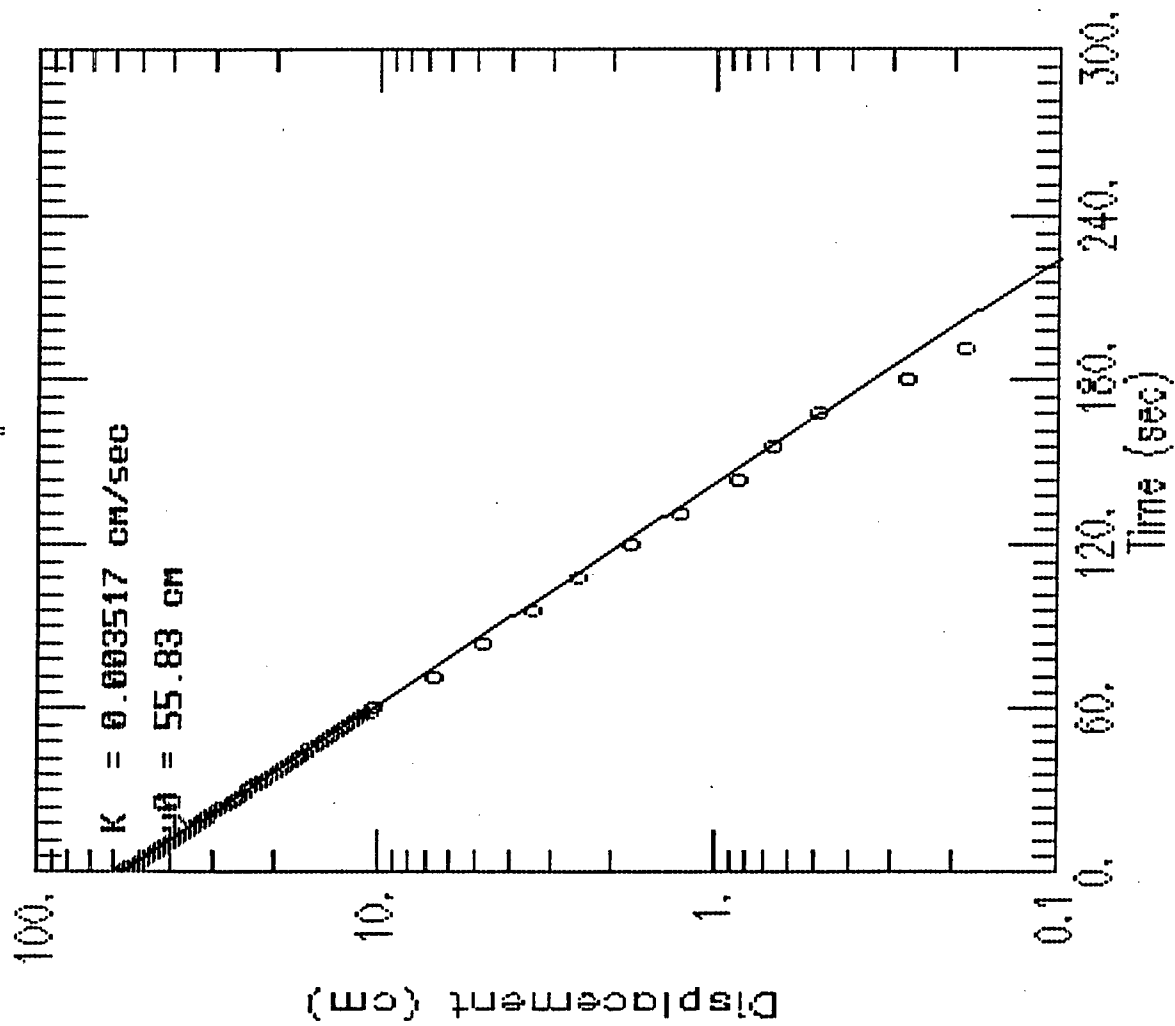
PERMEABILITY TEST #1 SHM-93-10C



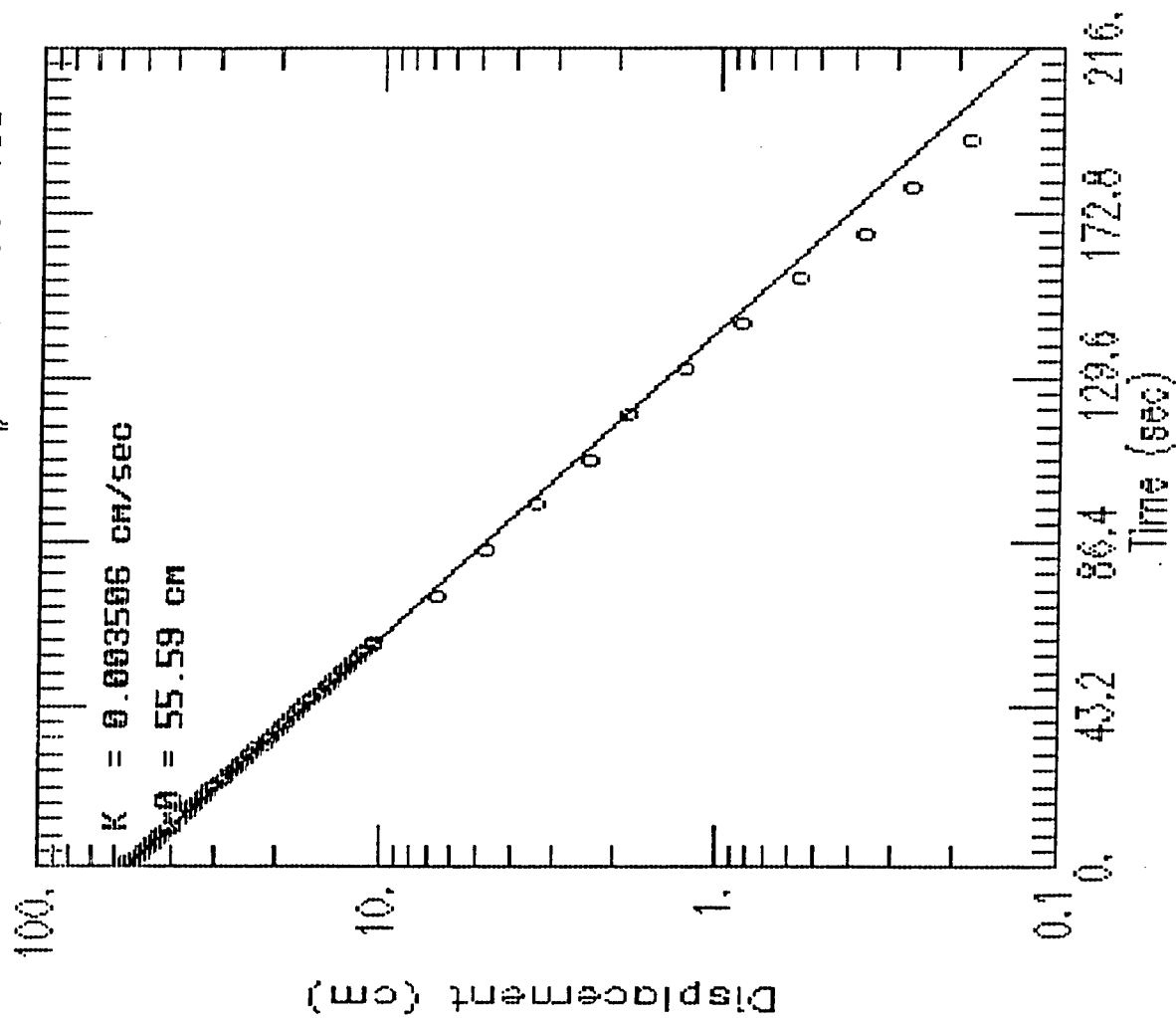
PERMEABILITY TEST #2 SHM-93-10C



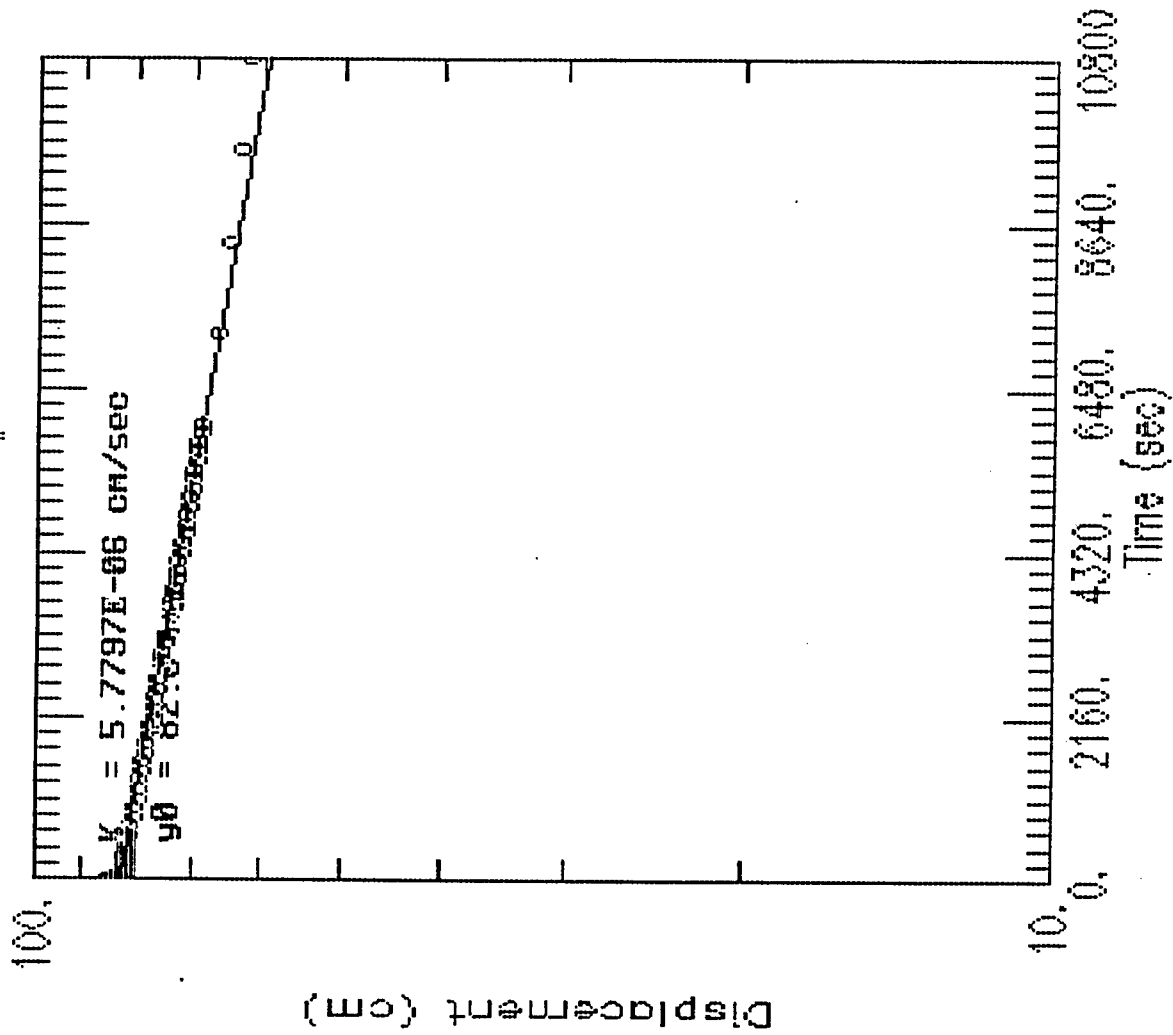
PERMEABILITY TEST #1 SHM-93-18B



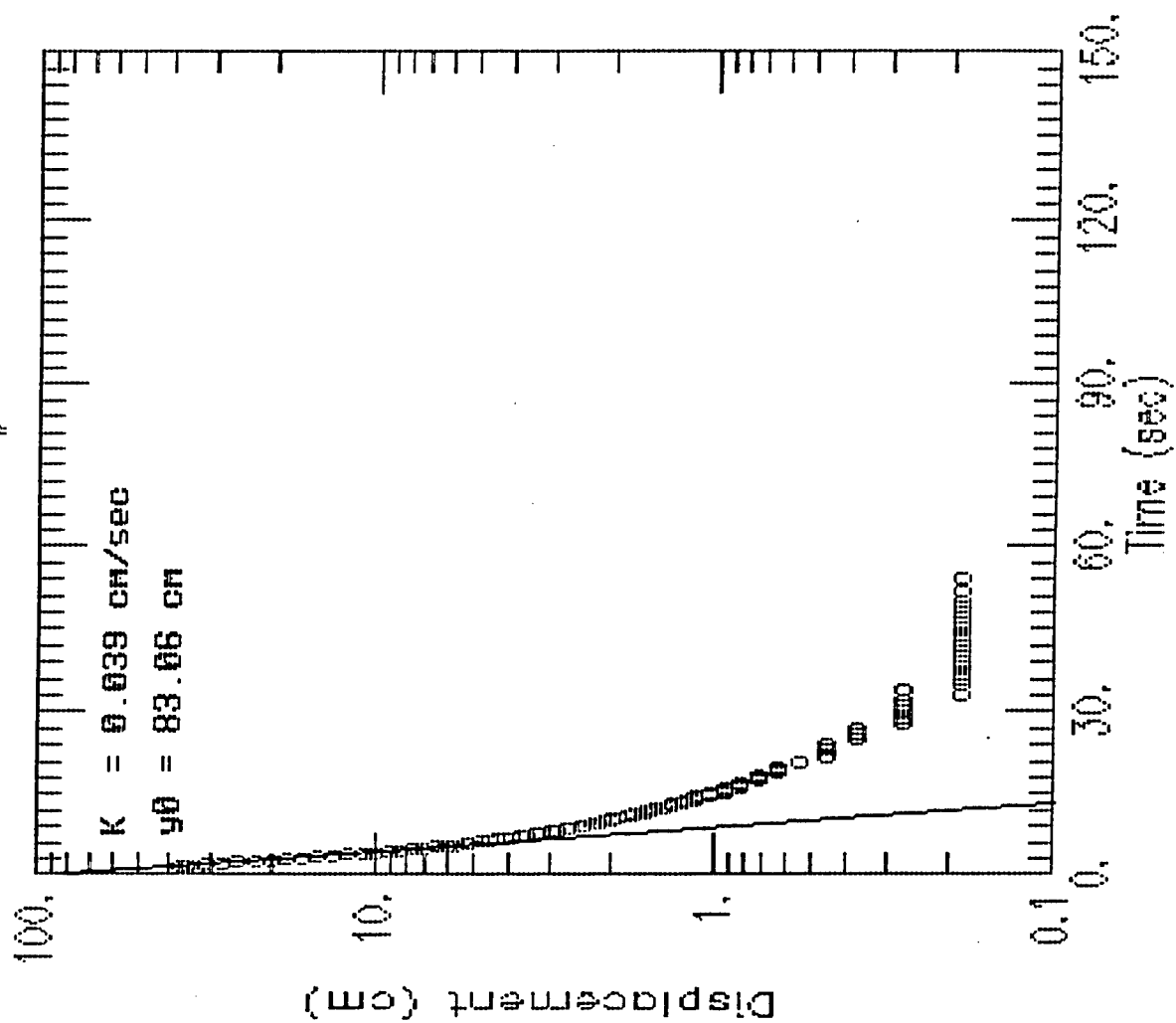
PERMEABILITY TEST #2 SHM-93-18B



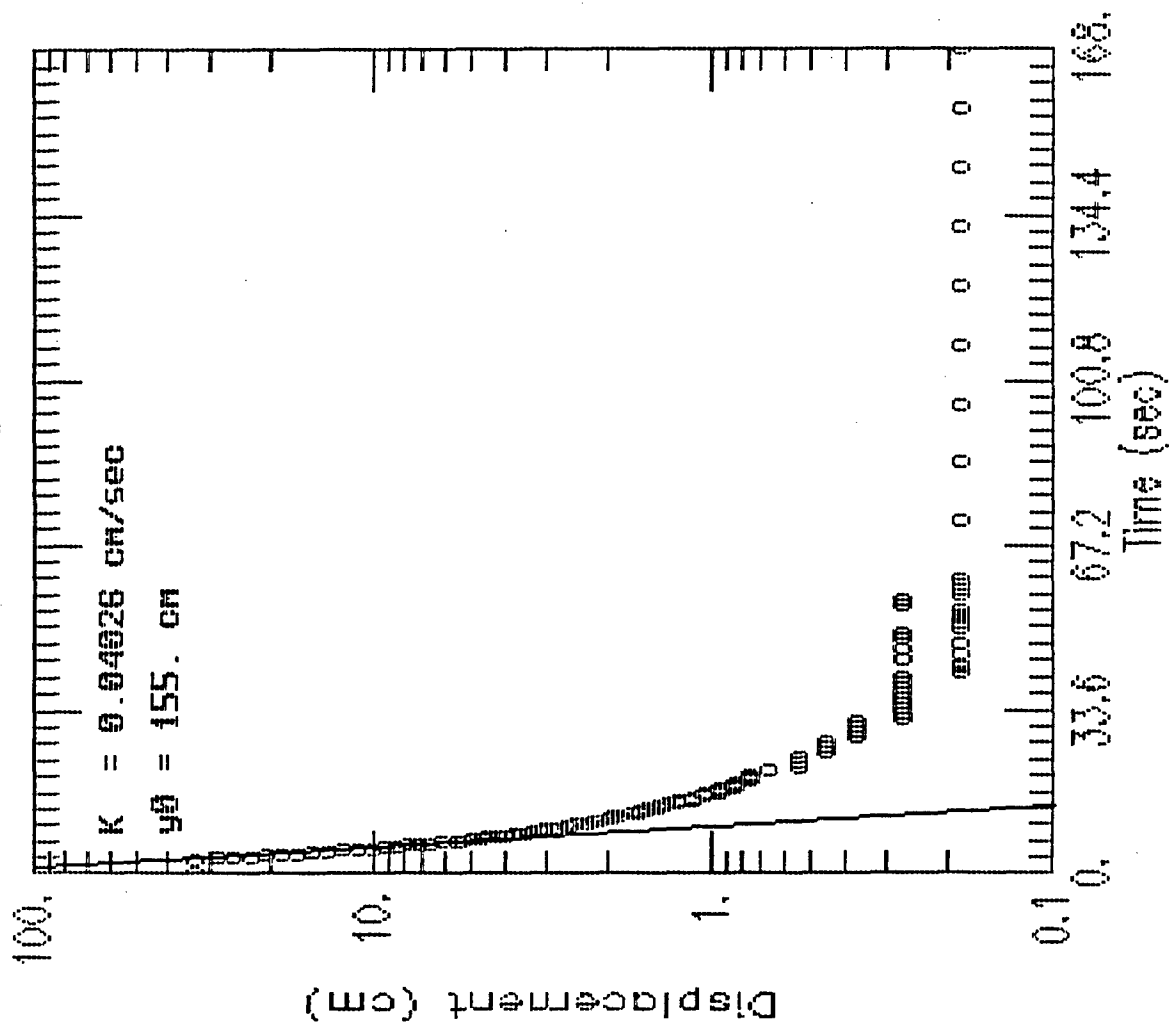
PERMEABILITY TEST #1 SHM-93-22C



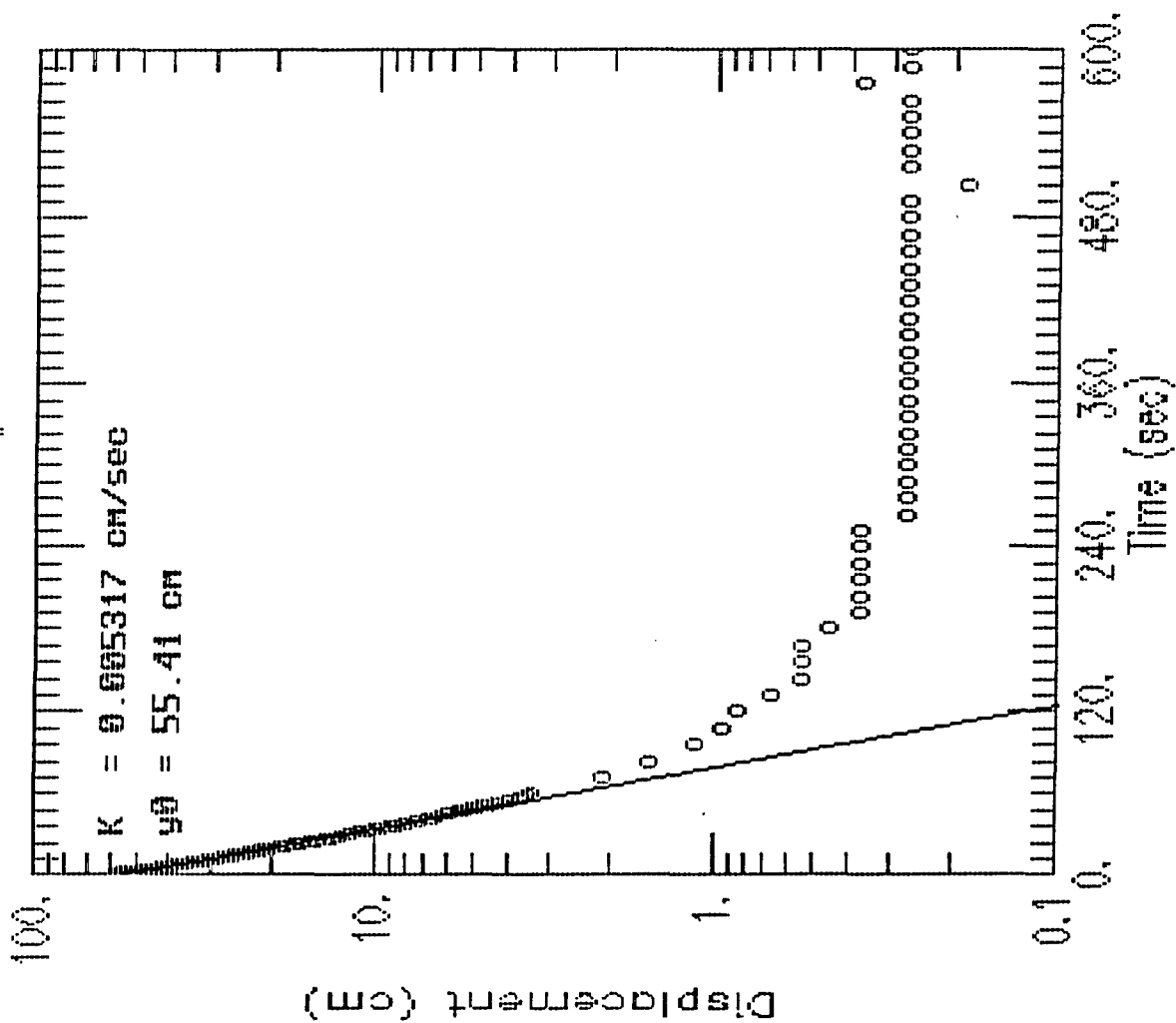
PERMEABILITY TEST #1 SHM-93-24A



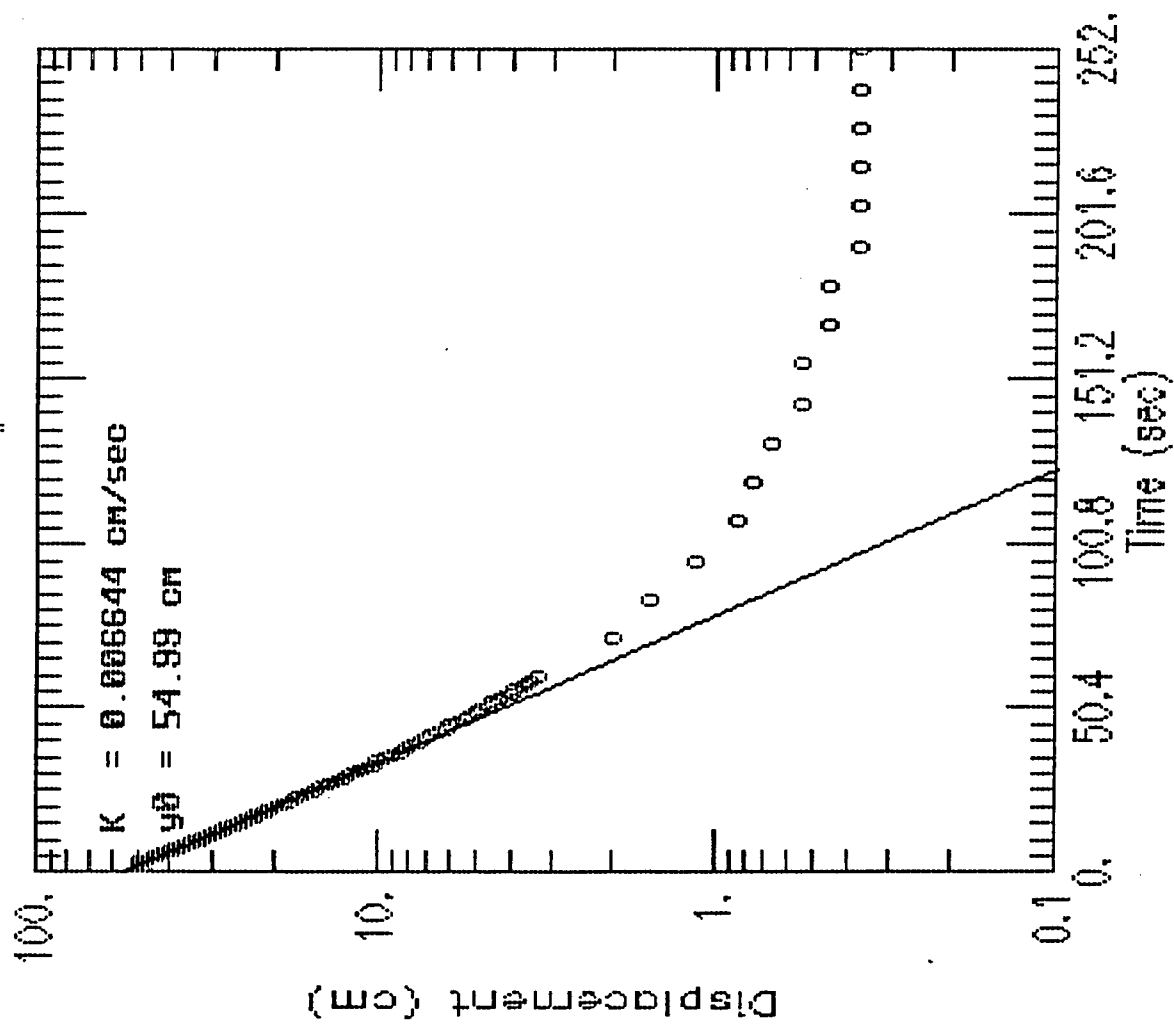
PERMEABILITY TEST #2 SHM-93-24A



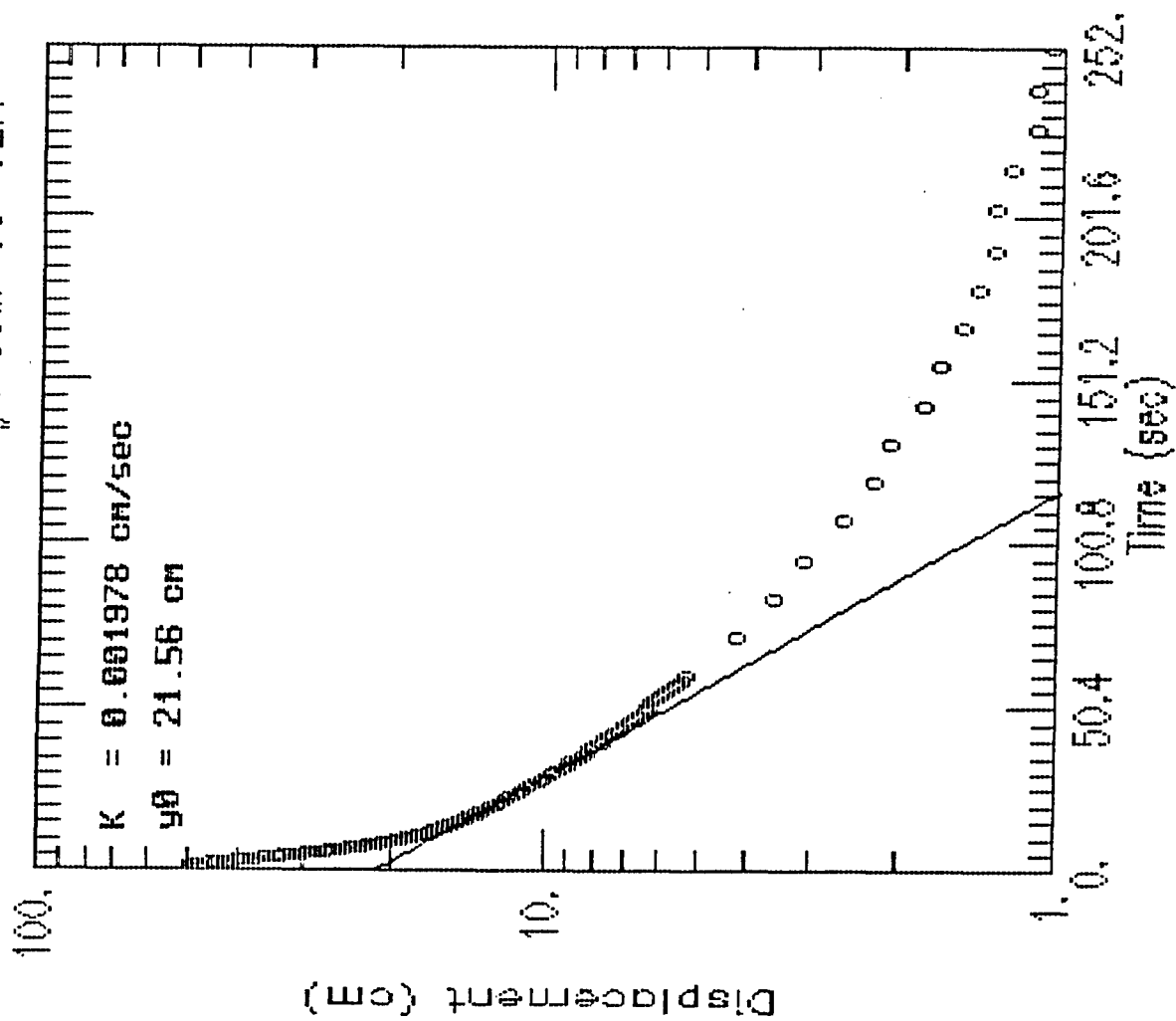
PERMEABILITY TEST #1 CSM-93-01A



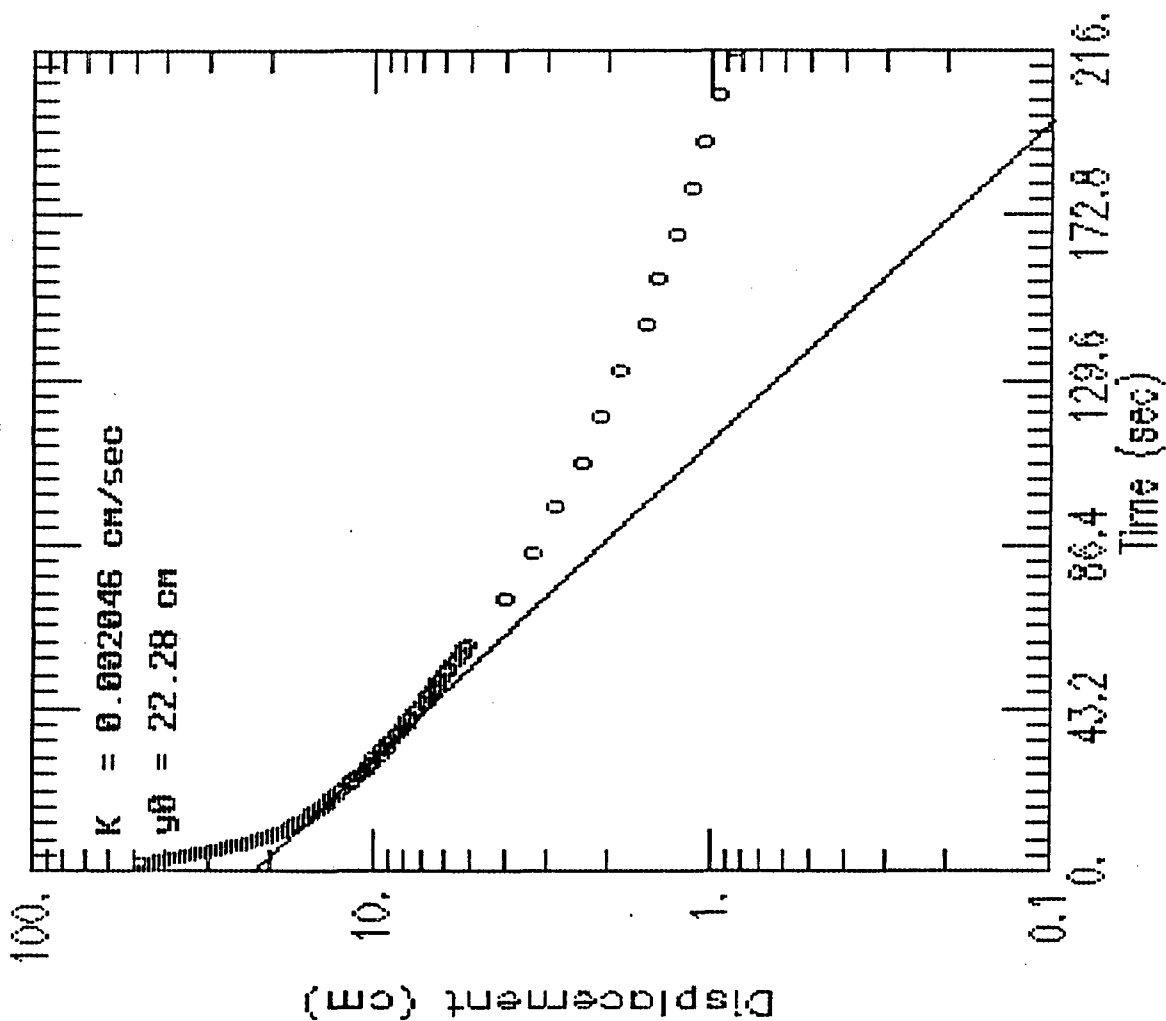
PERMEABILITY TEST #2 CSM-93-01A



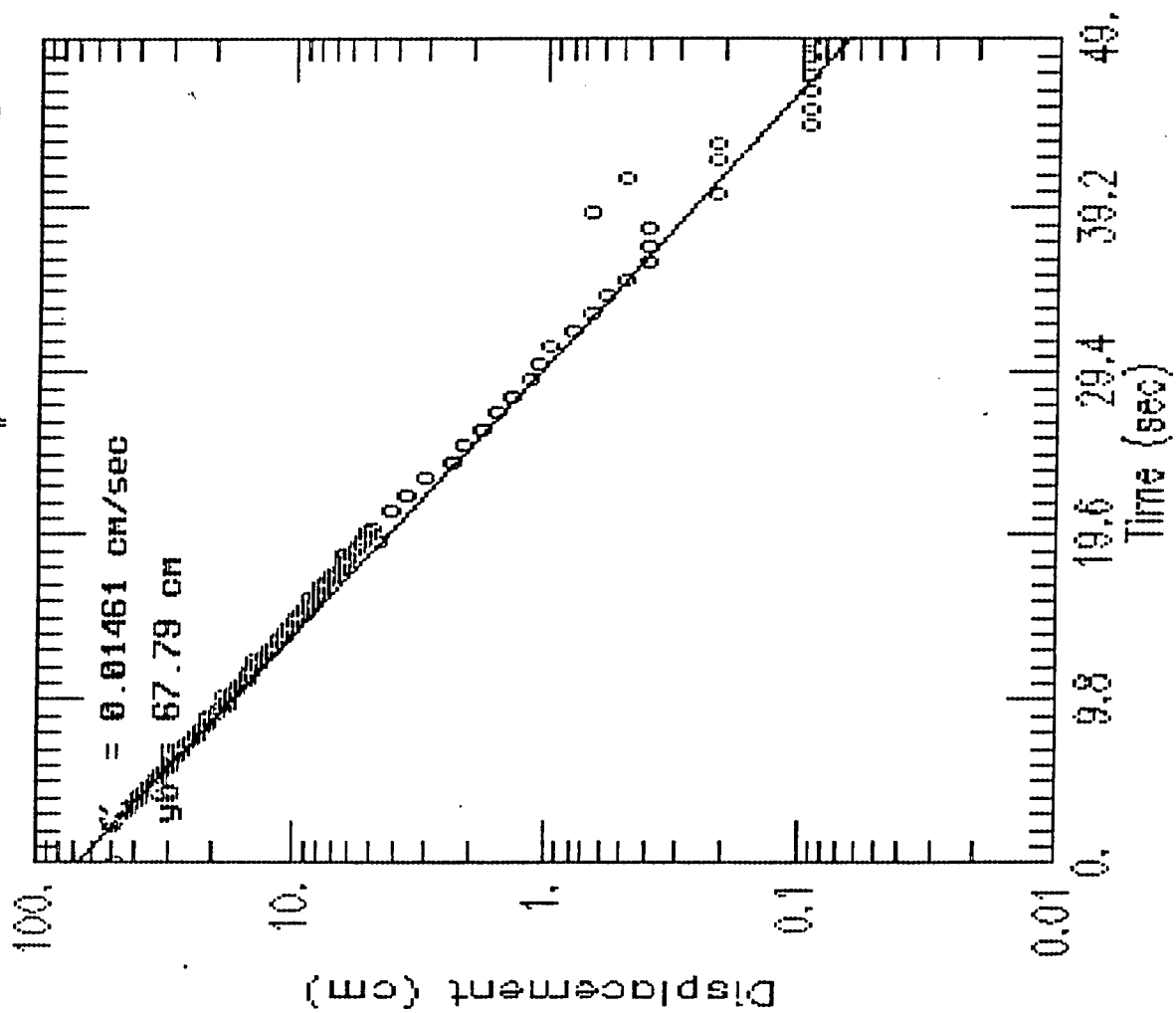
PERMEABILITY TEST #1 CSM-93-02A



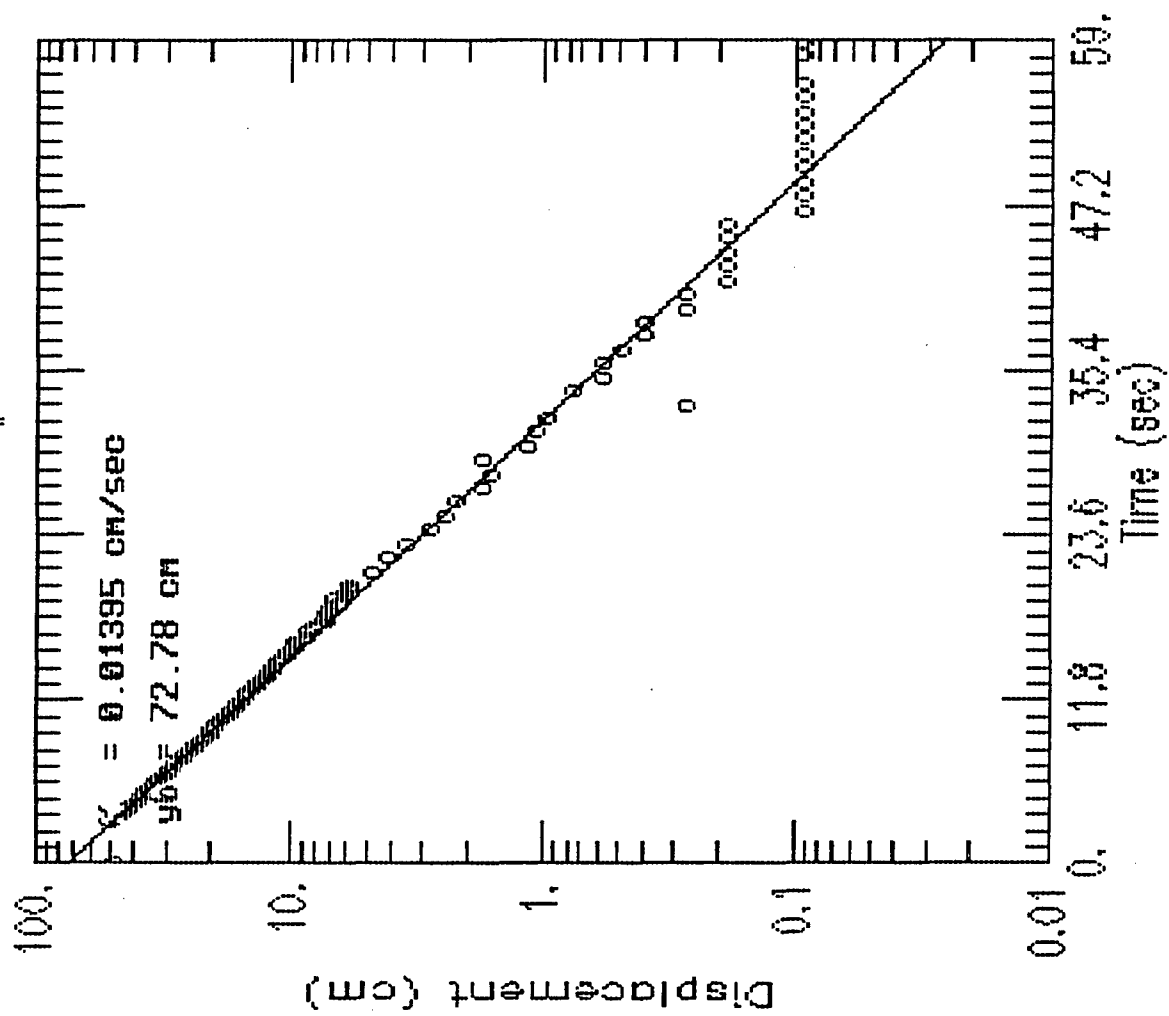
PERMEABILITY TEST #2 CSM-93-02A



PERMEABILITY TEST #1 CSM-93-02B



PERMEABILITY TEST #2 CSM-93-02B



APPENDIX D
GRAIN SIZE DISTRIBUTION ANALYSES

SHD-92-01X
SHD-92-12X
SHD-92-18X
SHD-92-19X
SHD-92-26X
SHD-92-27X
SHD-92-28X
SHD-92-29X
SHD-92-30X
SHD-92-31X
SHD-92-32X
SHB-93-01A (SHM-93-01A)
SHB-93-24A (SHM-93-24A)
SHB-93-18B (SHM-93-18B)
CSD-92-01X
CSD-92-02X
CSD-92-03X
CSD-92-04X
CSD-92-05X
CSD-92-06X
CSD-92-10X
CSD-92-12X
CSD-92-13X
CSB-93-01A (CSM-93-01A)
CSB-93-02B (CSM-93-02B)
MAD-92-02X
GRW-92-01X (GRD-92-01X)
GRW-92-04X (GRD-92-04X)

COBBLES		GRAVEL		SAND			SILT OR CLAY					
		coarse	fine	coarse	medium	fine						
Specimen Identification							MC%	LL	PL	PI	Gs	
Point ID SHD9201X Depth 3.0 ft							Cc	Cu	%Gravel	%Sand	%Silt	%Clay
4.75									0	38		62

Project No: 3923034G

GRAIN SIZE DISTRIBUTION CURVE

Environmental Science and Engineering

Gainesville, Florida

January 23, 1993

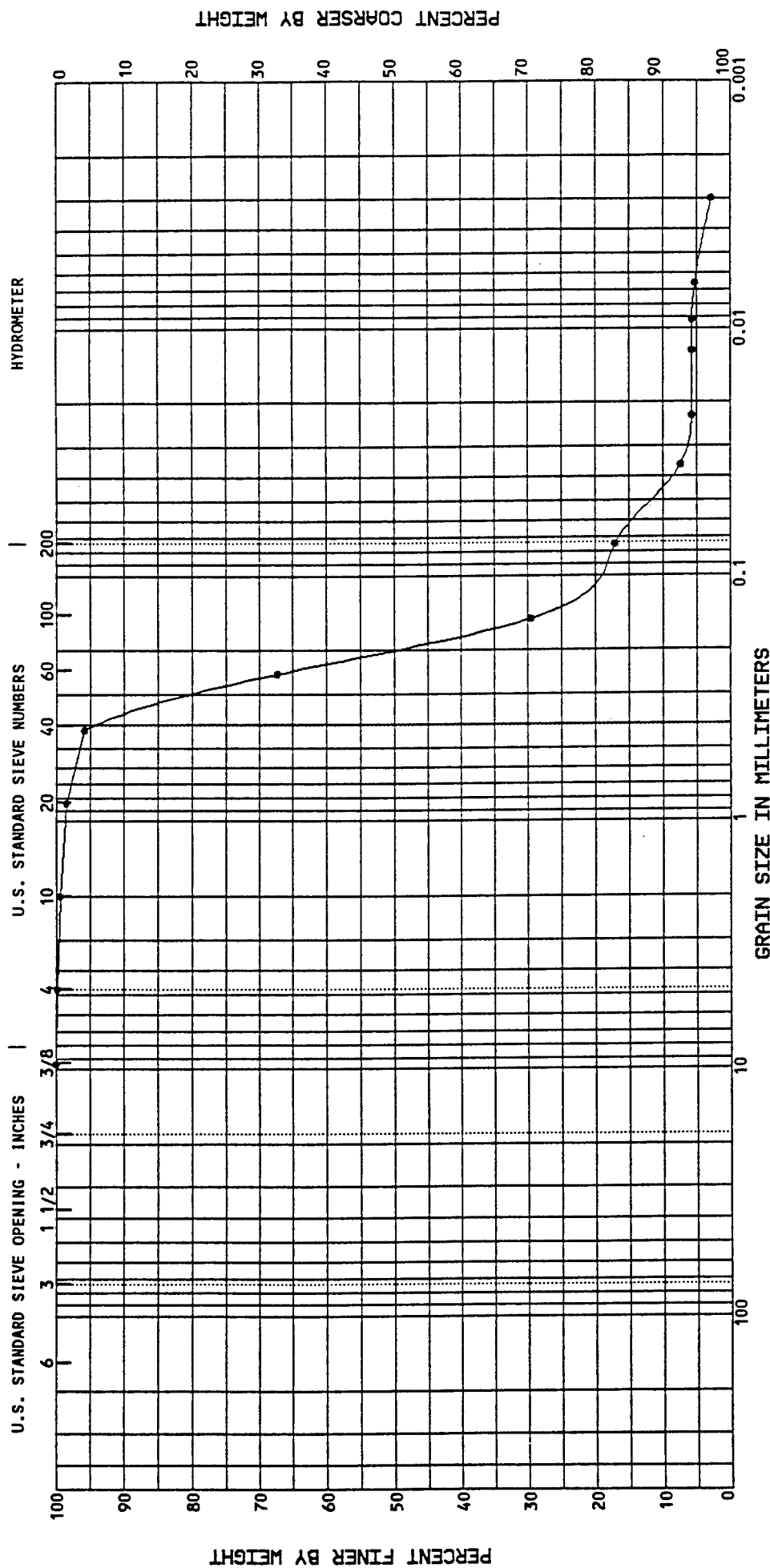
The graph illustrates the relationship between sieve opening size and the percentage of material finer or coarser by weight. The x-axis has two scales: U.S. Standard Sieve Opening in Inches (logarithmic scale from 100 to 0.001) and U.S. Standard Sieve Numbers (linear scale from 4 to 200). The y-axis has two scales: Percent Finer by Weight (bottom, 0 to 100) and Percent Coarser by Weight (top, 100 to 0). A curve is plotted with data points, showing that as the sieve opening decreases (sieve number increases), the percentage of material finer by weight decreases.

Sieve Opening (inches)	Sieve Number	Percent Finer (%)	Percent Coarser (%)
100	4	0	100
37.5	10	10	90
20	20	20	80
10	40	40	60
60	60	60	40
25	100	80	20
15	150	90	10
10	200	95	5

COBBLES		GRAVEL		SAND			SILT OR CLAY									
		coarse	fine	coarse	medium	fine										
Specimen Identification							Classification			WC%	LL	PL	PI	Gs		
Point ID SHD9201X Depth 5.0 ft							Poorly Graded Sand SP									
							D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt	%Clay
							4.75	0.53	0.317	0.2046	0.92	2.6	0	98	2	

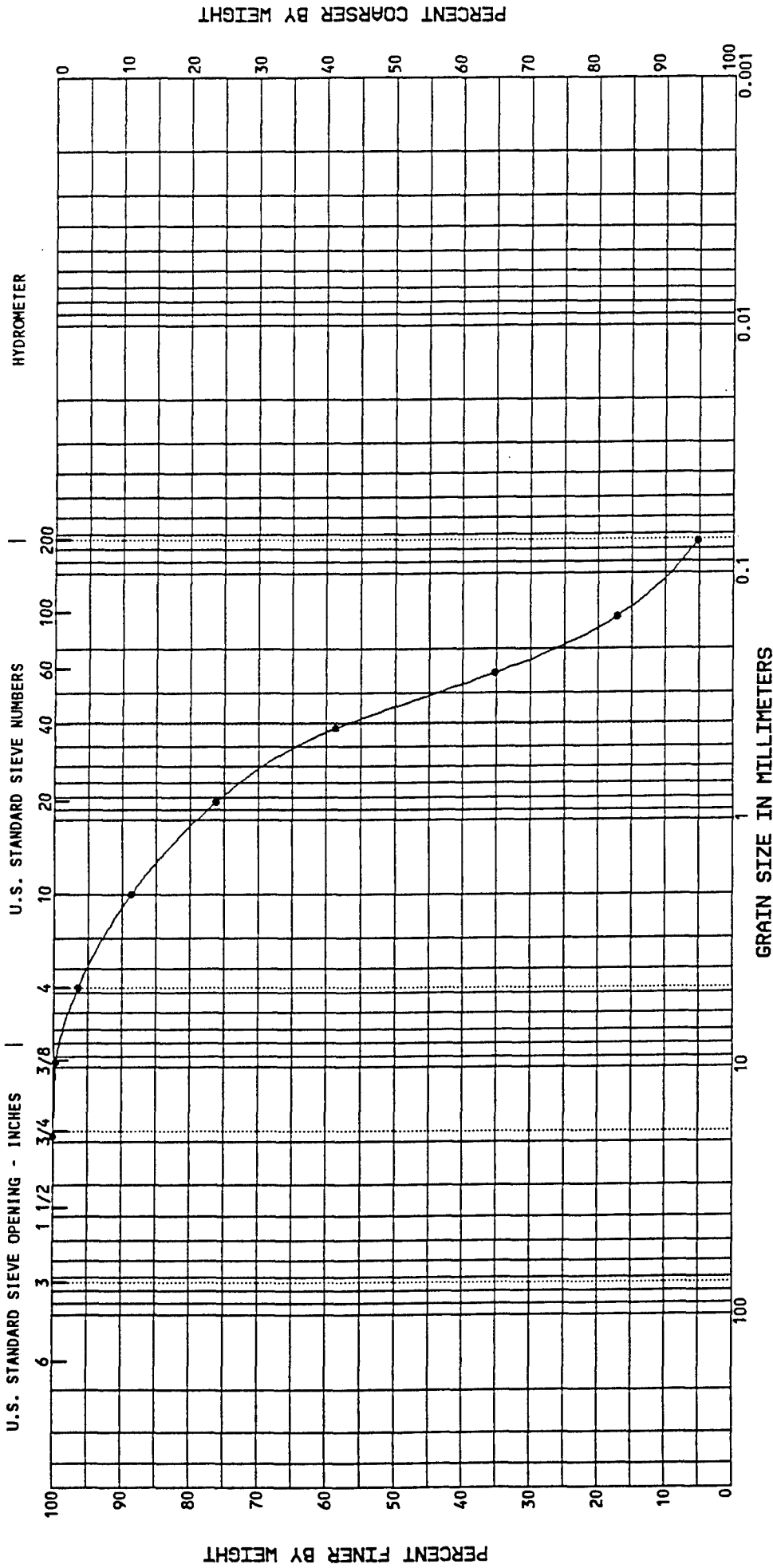
Ft. Devens
Boston, Mass.
Project No: 3923034G

1/23/93grns292

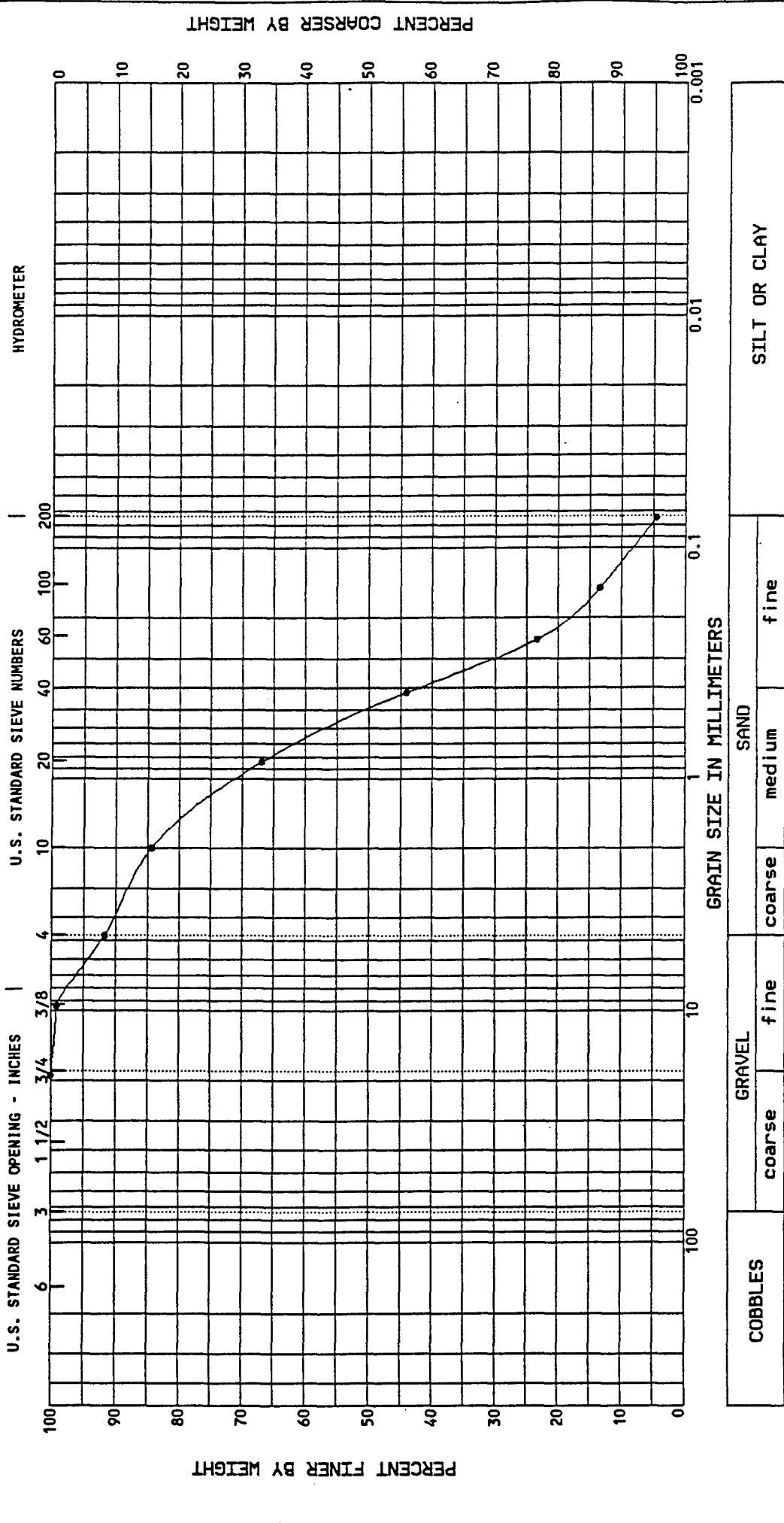


COBBLES		GRAVEL		SAND			SILT OR CLAY					
		coarse	fine	coarse	medium	fine						
Specimen Identification		Classification					WC%	LL	PL	PI	Gs	
		D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt	%Clay	
Point ID SHD9212X Depth 4.0 ft		9.50	0.23	0.151	0.0438			0	83	13	5	
Ft. Devens Boston, Mass.		GRAIN SIZE DISTRIBUTION CURVE					Environmental Science and Engineering Gainesville, Florida January 23, 1993					
Project No: 3923034G												

1/23/93grnsz92

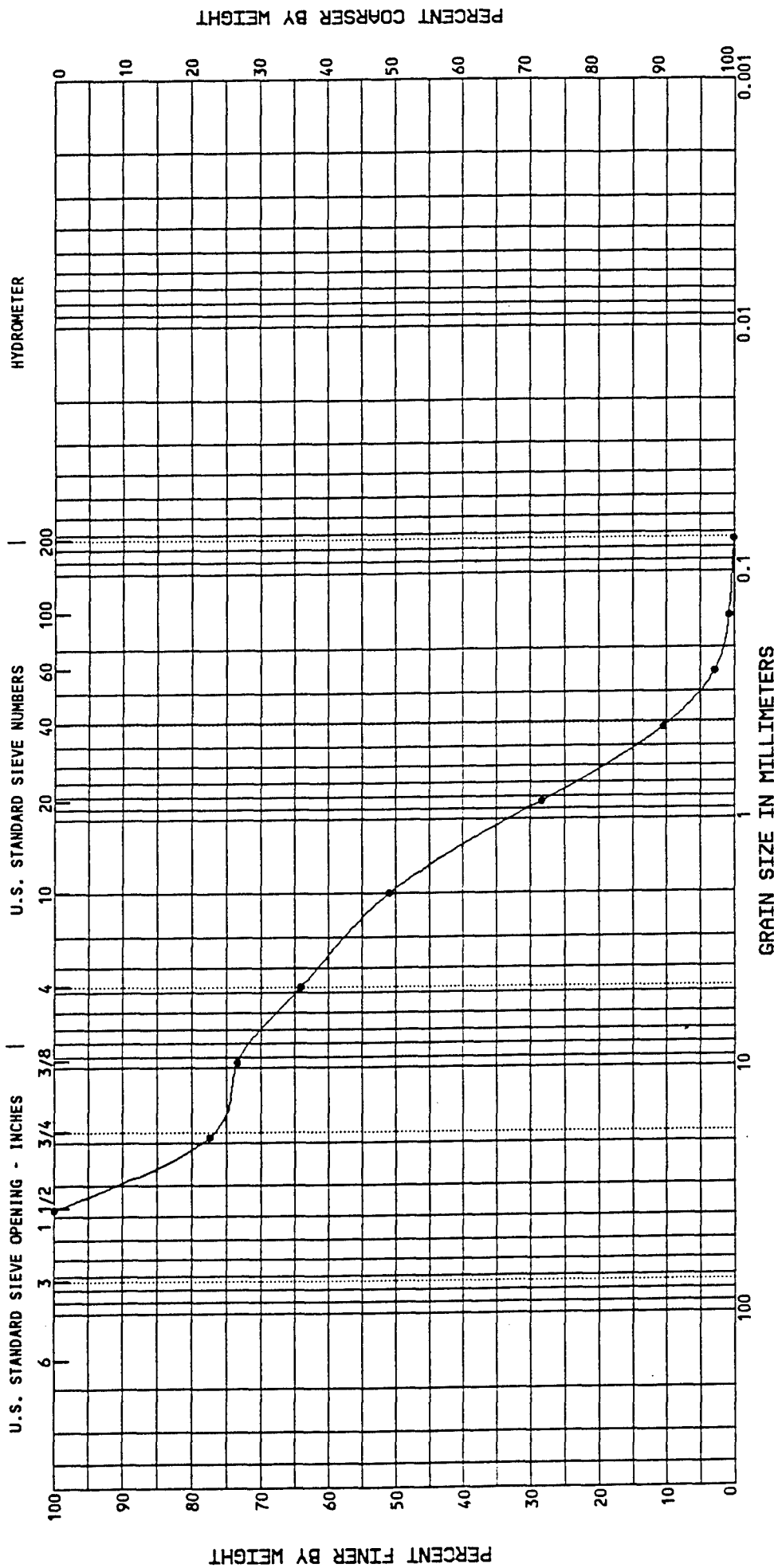


1/23/93grnsr92



Specimen Identification		Classification					MC%		LL	PL	PI	Gs
Point ID SHD9219X	Depth 0.0 ft	D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt	%Clay	5
		19.00	0.68	0.295	0.1148	1.11	5.9	8	87			

1/23/93grnsz92



COBBLES		GRAVEL		SAND			SILT OR CLAY		
coarse		fine		coarse	medium	fine			
<div> <div> <div>U.S. STANDARD SIEVE OPENING - INCHES</div> <div> <div>100</div> <div>6</div> <div>3</div> <div>1 1/2</div> <div>3/4</div> <div>3/8</div> <div>4</div> <div>10</div> <div>20</div> <div>40</div> <div>60</div> <div>100</div> <div>200</div> </div> <div>U.S. STANDARD SIEVE NUMBERS</div> </div> <div> <div>PERCENT FINER BY WEIGHT</div> <div> <div>100</div> <div>90</div> <div>80</div> <div>70</div> <div>60</div> <div>50</div> <div>40</div> <div>30</div> <div>20</div> <div>10</div> <div>0</div> </div> </div> <div> <div>GRAIN SIZE IN MILLIMETERS</div> <div> <div>100</div> <div>60</div> <div>30</div> <div>15</div> <div>7.5</div> <div>3.75</div> <div>1.9</div> <div>0.85</div> <div>0.425</div> <div>0.25</div> <div>0.15</div> <div>0.075</div> <div>0.0425</div> <div>0.025</div> <div>0.015</div> <div>0.0075</div> </div> </div> <div> <div>PERCENT COARSER BY WEIGHT</div> <div> <div>0</div> <div>10</div> <div>20</div> <div>30</div> <div>40</div> <div>50</div> <div>60</div> <div>70</div> <div>80</div> <div>90</div> <div>100</div> </div> </div> <div> <div>HYDROMETER</div> <div> <div>0</div> <div>10</div> <div>20</div> <div>30</div> <div>40</div> <div>50</div> <div>60</div> <div>70</div> <div>80</div> <div>90</div> <div>100</div> </div> </div> </div> <div> <div>Specimen Identification</div> <div> <div>Point ID SH09226X</div> <div>Depth 0.0 ft</div> </div> </div> <div> <div>Classification</div> <div>Poorly Graded Gravel with Sand GP</div> </div> <div> <div>WC%</div> <div>LL</div> <div>PL</div> <div>PI</div> <div>GS</div> </div> <div> <div>D100</div> <div>D60</div> <div>D30</div> <div>D10</div> <div>Cc</div> <div>Cu</div> <div>%Gravel</div> <div>%Sand</div> <div>%Silt</div> <div>%Clay</div> </div> <div> <div>37.50</div> <div>22.16</div> <div>0.769</div> <div>0.1739</div> <div>0.15</div> <div>127.4</div> <div>55</div> <div>42</div> <div></div> <div>3</div> </div>									

**Ft. Devens
Boston, Mass.**

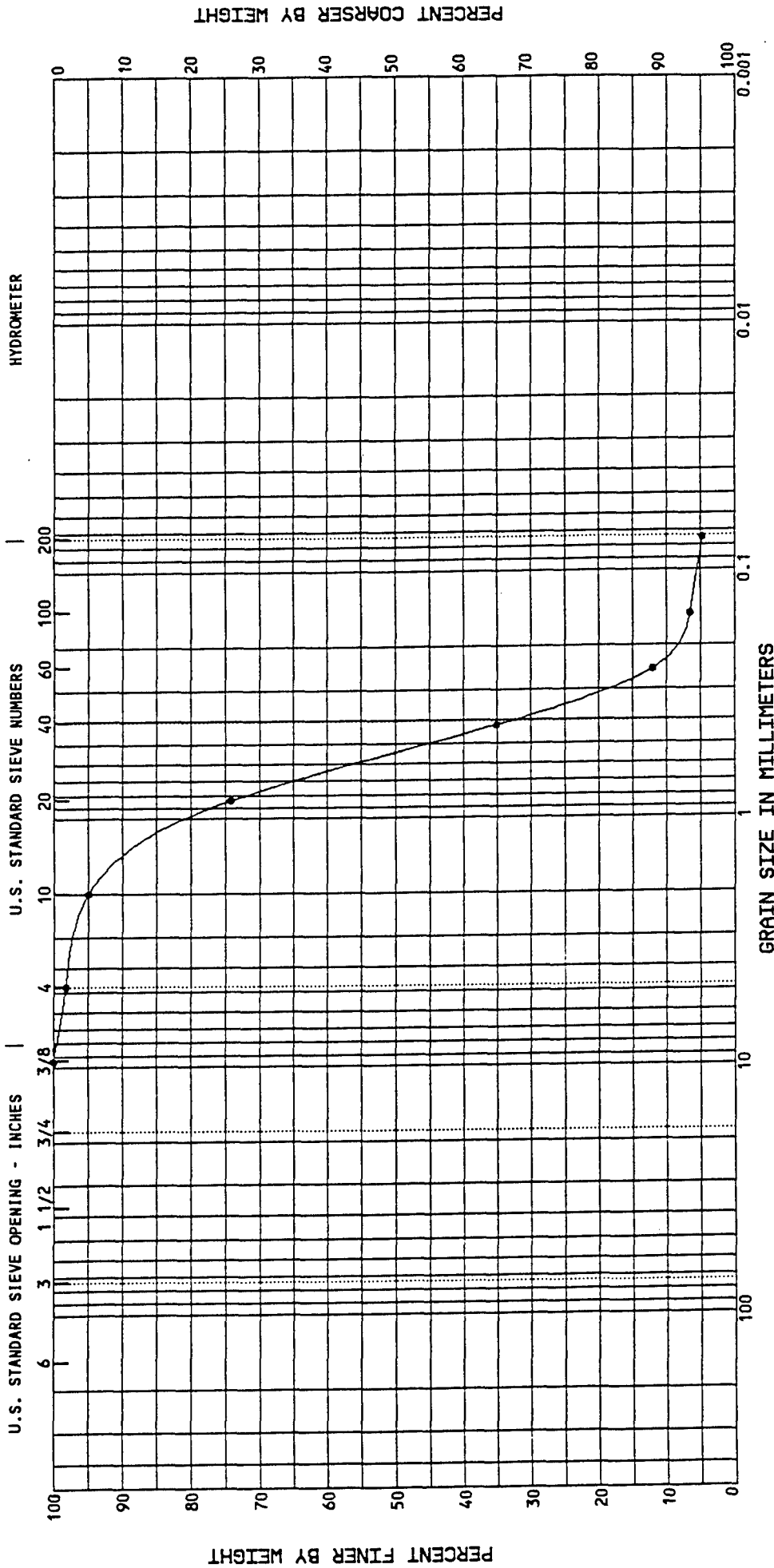
GRAIN SIZE DISTRIBUTION CURVE

**Environmental Science and Engineering
Gainesville, Florida**

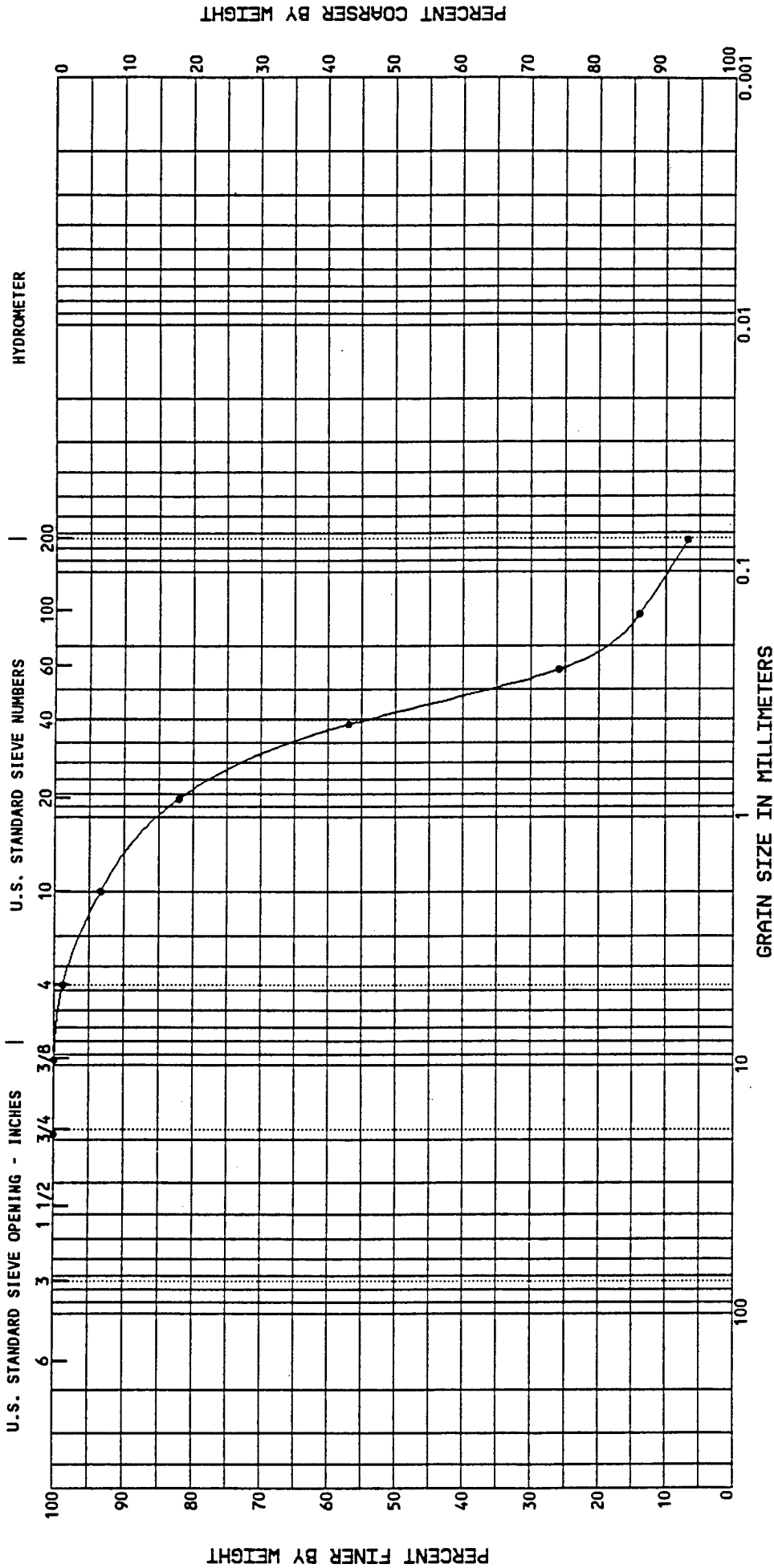
January 23, 1993

Project No: 3923034G

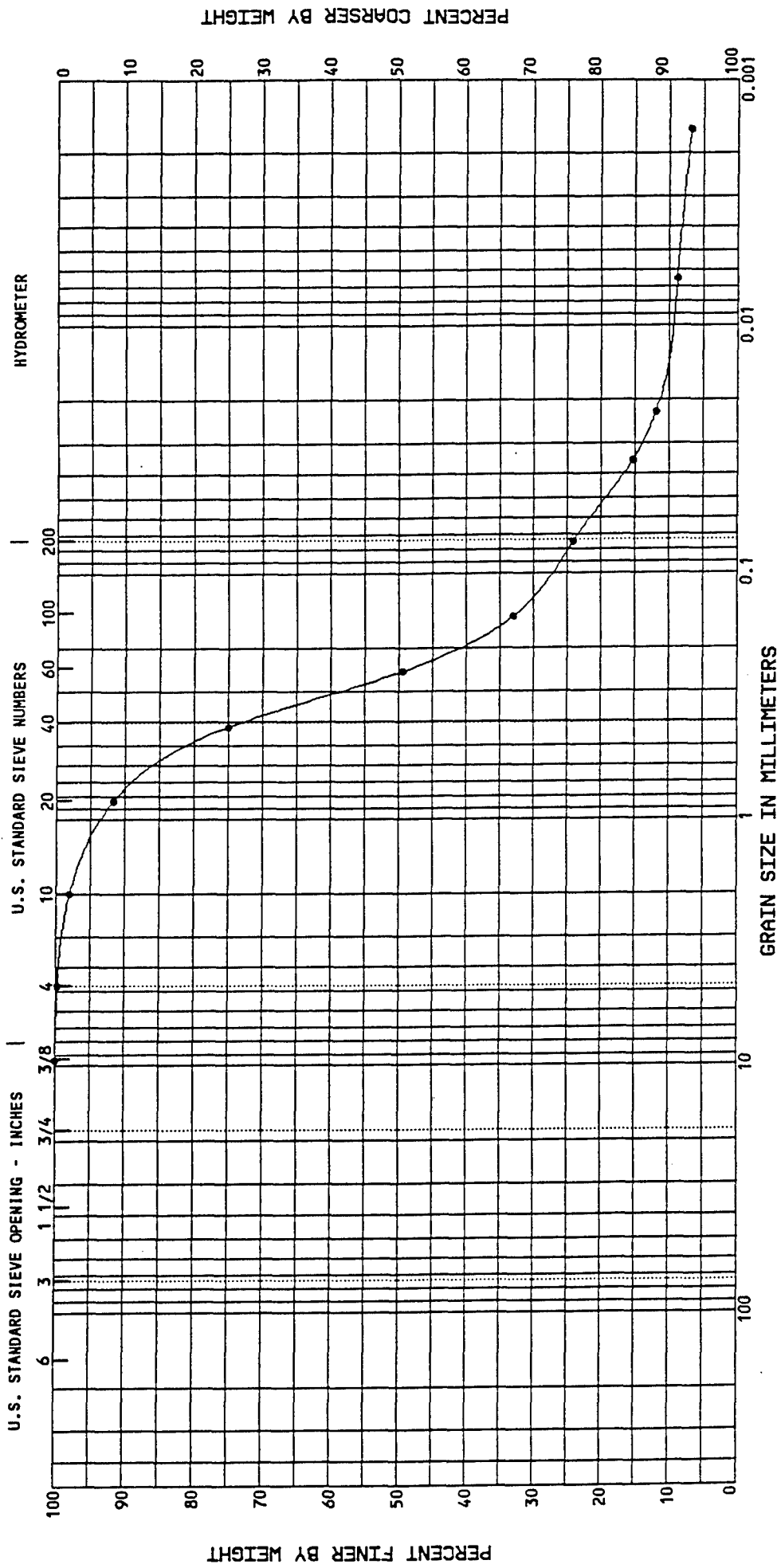
1/23/93grnsz92



1/23/93grnsz92



1/23/93grns292



U.S. STANDARD SIEVE OPENING - INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

GRAVEL

COBBLES

SAND

SILT OR CLAY

COBBLES		GRAVEL		SAND			SILT OR CLAY			
coarse	fine	coarse	medium	fine	WC%	LL	PL	PI	Gs	
Specimen Identification										
Point ID SHD9229X Depth 2.0 ft										
D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt	%Clay	
37.50	0.73	0.250	0.0942	0.91	7.8	24	69		7	

Project No: 3923034G

Specimen Identification

Classification

%CM

77

PL

59

D100

030

010

6

2

cavel

%sand

15%

13%

2

Project No: 3923034G

GRAIN SIZE DISTRIBUTION CURVE

Environmental Science and Engineering

Gainesville, Florida

January 23, 1993

Specimen Identification						Classification								SILT OR CLAY								
COBBLES		GRAVEL		SAND		WC%	LL	PL	PI	Gs												
		coarse	fine	coarse	medium						fine	%Gravel	%Sand	%Silt	%Clay							
Point ID SHD9230X Depth 0.0 ft												D100	D60	D30	D10	Cc	Cu					
												9.50	0.28	0.066	0.0050			2	68	21	10	

Project No: 3923034G

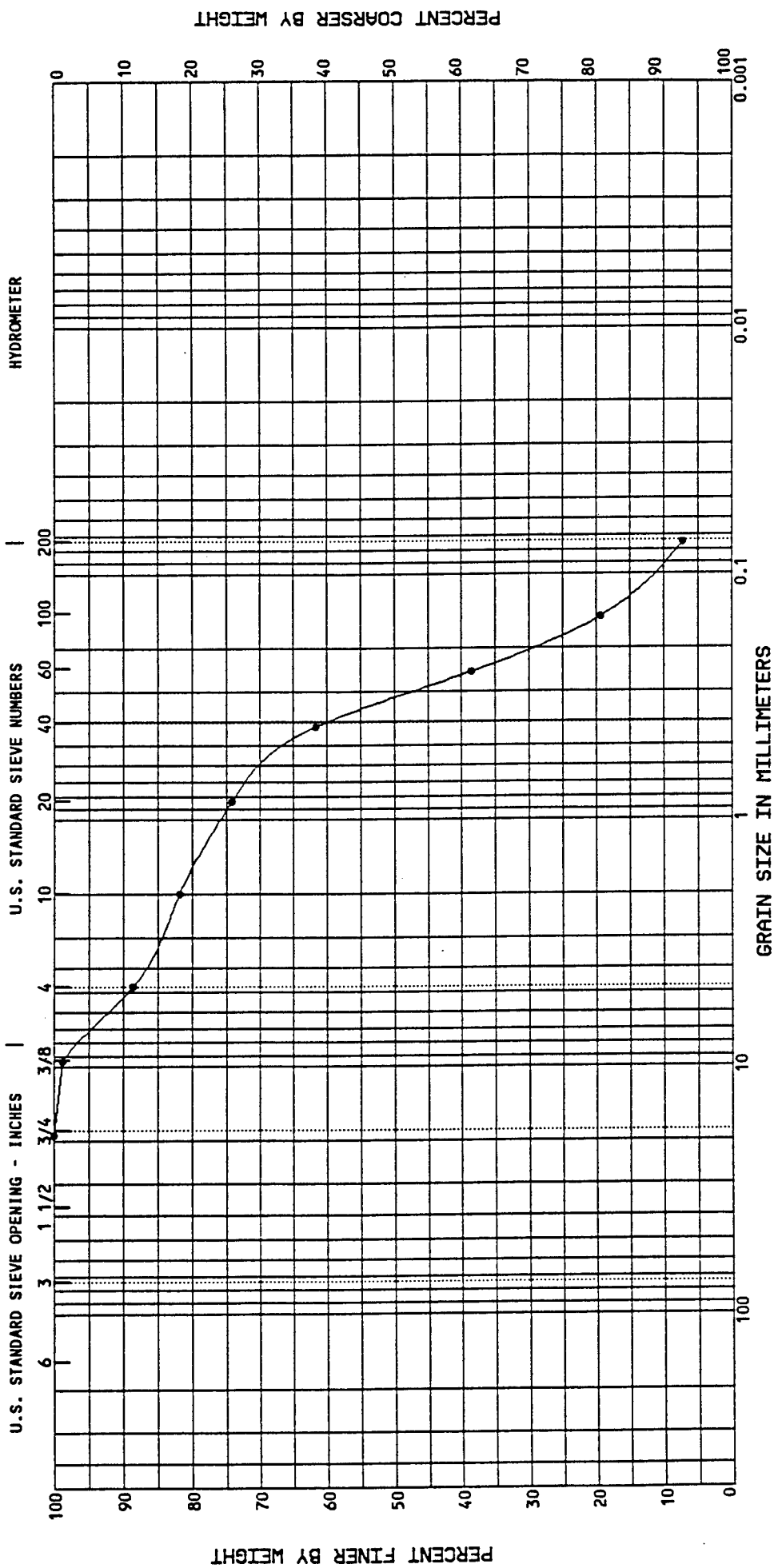
GRAIN SIZE DISTRIBUTION CURVE

Environmental Science and Engineering

Gainesville, Florida

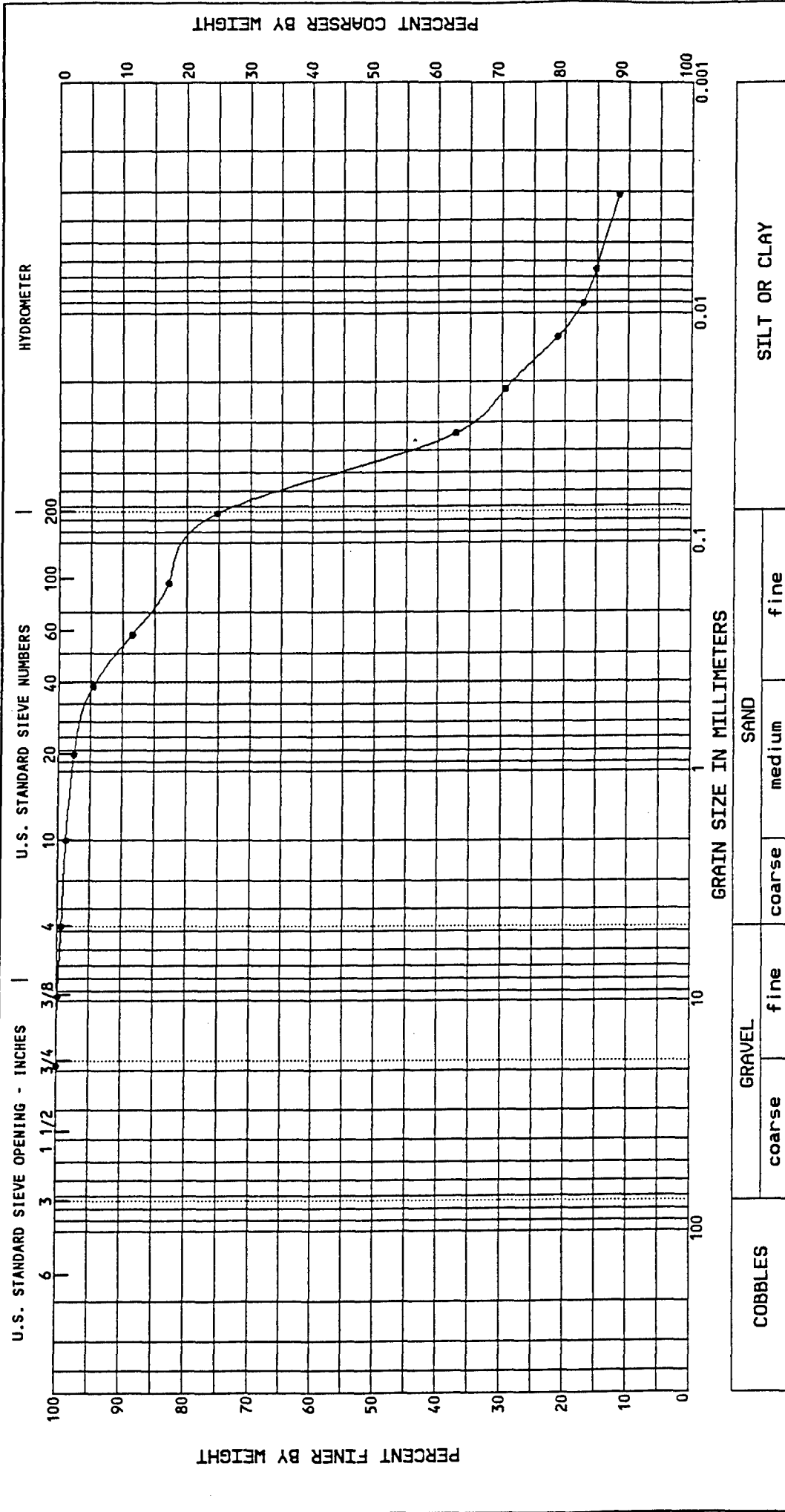
January 23, 1993

1/23/93grnsz92



COBBLES		GRAVEL		SAND			SILT OR CLAY					
coarse		fine		coarse	medium	fine			PL	PI	Gs	
Specimen Identification		Classification					WC%	LL				
		D100	D60	D30	D10	Cc		Cu	%Gravel	%Sand	%Silt	%Clay
Point ID SHD9230X Depth 2.0 ft		19.00	0.40	0.199	0.0875	1.12	4.6	11	81		7	
Ft. Devens Boston, Mass. Project No: 3923034G		GRAIN SIZE DISTRIBUTION CURVE					Environmental Science and Engineering Gainesville, Florida January 23, 1993					

1/23/93grnsz92



Specimen Identification		Classification				Gravel				Silt or Clay			
Point ID SHD9231X Depth 0.0 ft													
		D100	D60	D30	D10	Cc	Cu			%Gravel	%Sand	%Silt	%Clay
		19.00	0.05	0.022						1	24	61	14

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 Boston, Mass.
 Project No: 3923034G
 Environmental Science and Engineering
 Gainesville, Florida
 January 23, 1993

PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT

U.S. STANDARD SIEVE OPENING - INCHES

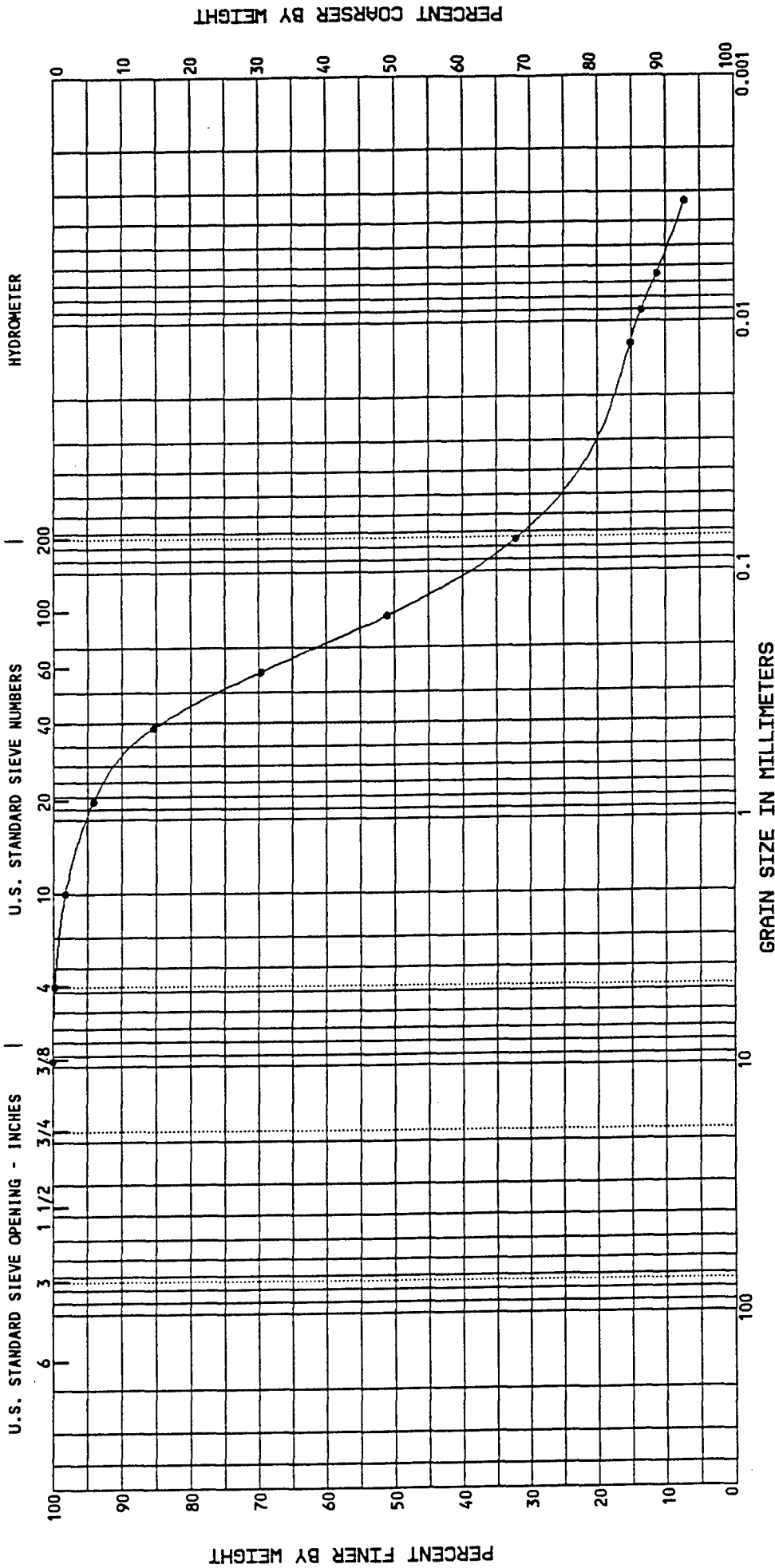
U.S. STANDARD SIEVE NUMBERS

GRAIN SIZE IN MILLIMETERS

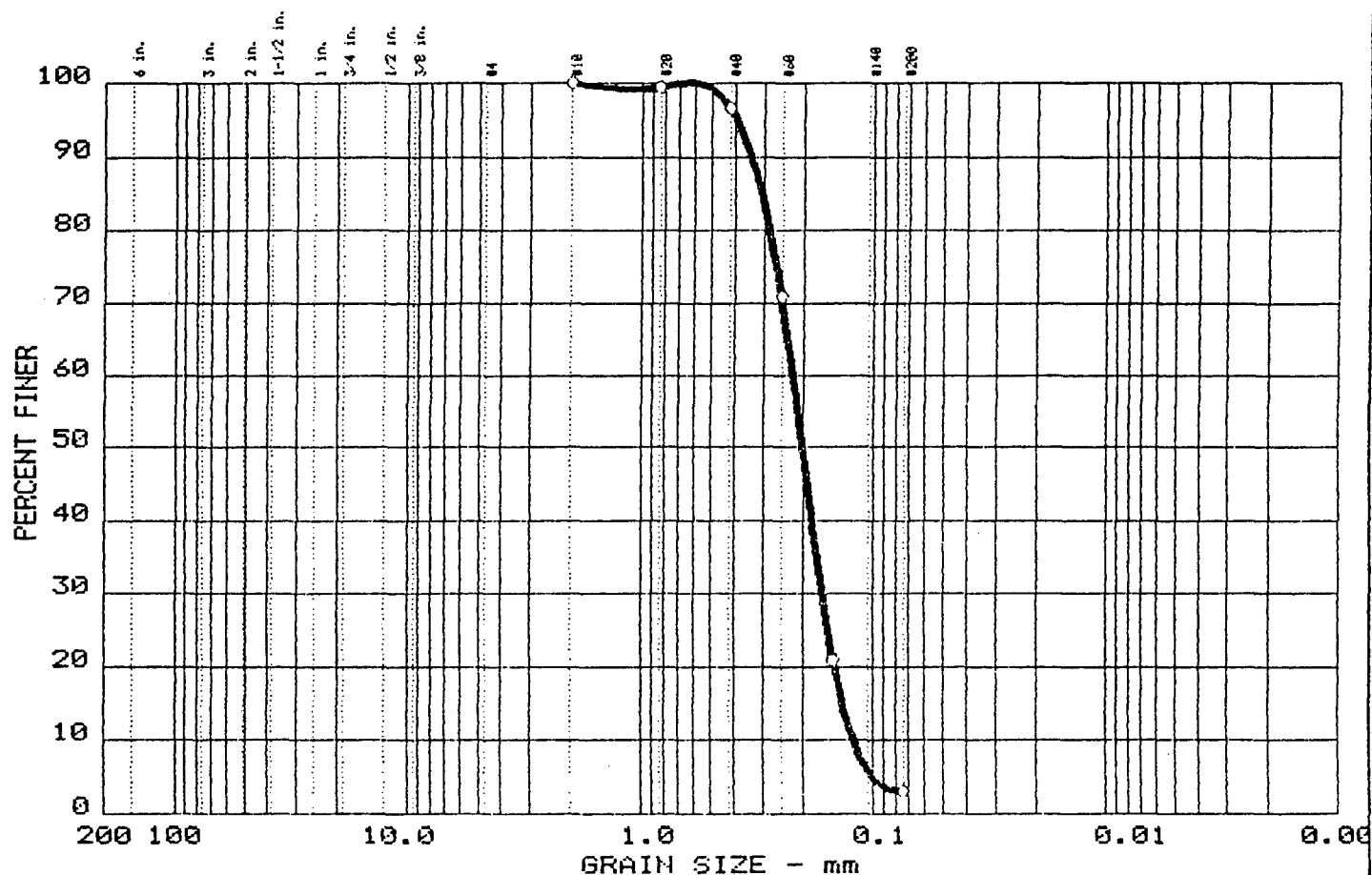
Grain Size (mm)	U.S. Standard Sieve	Percent Finer (%)	Percent Coarser (%)
0.075	No. 200	100	0
0.15	No. 100	95	5
0.3	No. 60	85	15
0.6	No. 30	75	25
1.18	No. 16	65	35
2.5	No. 6	55	45
5.0	No. 3	45	55
10.0	No. 2	35	65
20.0	No. 1	25	75
40.0	No. 4	15	85
60.0	No. 3	10	90
100.0	No. 2	5	95
200.0	No. 1	0	100

COBBLES	GRAVEL		SAND			SILT OR CLAY						
	coarse	fine	coarse	medium	fine							
Specimen Identification			Classification			WC%	LL	PL	PI	Gs		
Point ID SHD9231X Depth 1.0 ft												
	D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt	%Clay		
	9.50	0.28	0.113	0.0045			2	76	13	10		
Ft. Devens Boston, Mass.			GRAIN SIZE DISTRIBUTION CURVE								Environmental Science and Engineering Gainesville, Florida January 23, 1993	
Project No: 3923034G												

1/23/93grnsz92



GRAIN SIZE DISTRIBUTION TEST REPORT



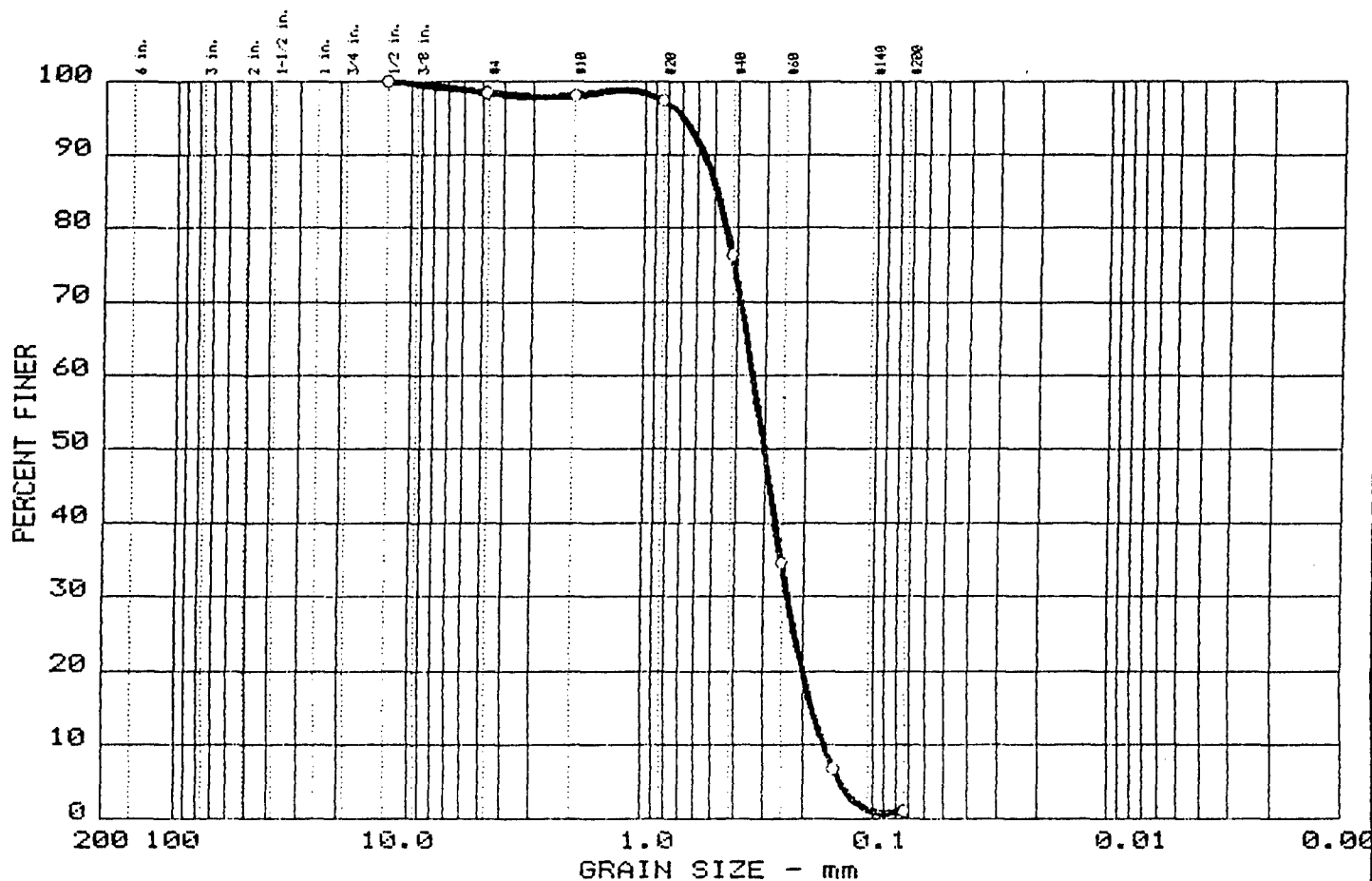
% +3"	% GRAVEL	% SAND	% FINES
0.0	0.0	96.9	3.1

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
--	--	0.31	0.22	0.20	0.166	0.1361	0.1226	1.01	1.8

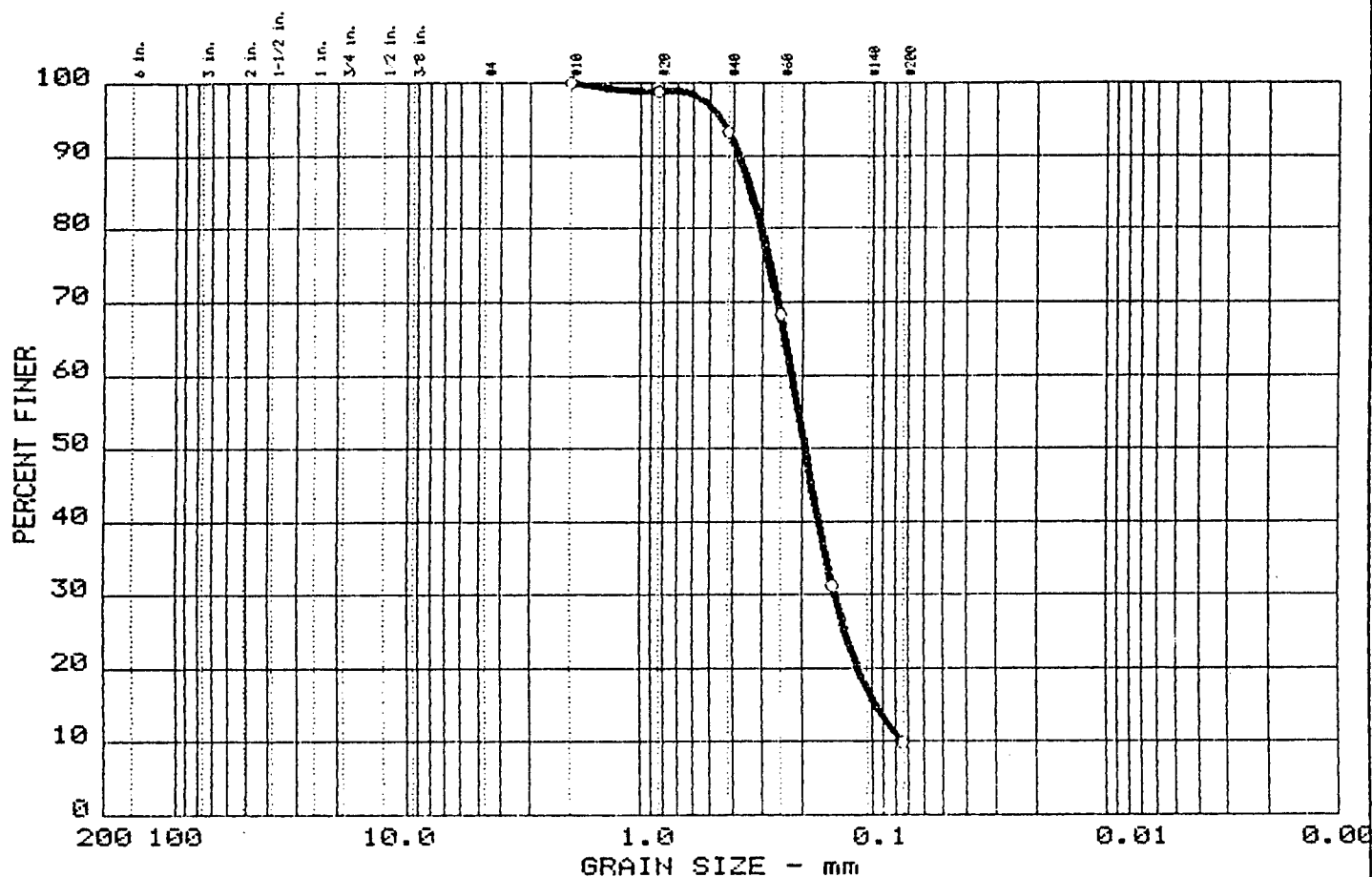
MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly Graded SAND	SP	--

Project No.: 7005-04 Project: USATHAMA - Fort Devens: Group 1A ○ Location: Site ID - SHB-93-01A Date: March 25, 1993	Remarks: Sample ID SHB-93-012 Depth 5'-7'/10'-12' As rec'd w% = 6.8
GRAIN SIZE DISTRIBUTION TEST REPORT CIVILTEST LABORATORIES, INC.	CT - 1493

GRAIN SIZE DISTRIBUTION TEST REPORT



GRAIN SIZE DISTRIBUTION TEST REPORT



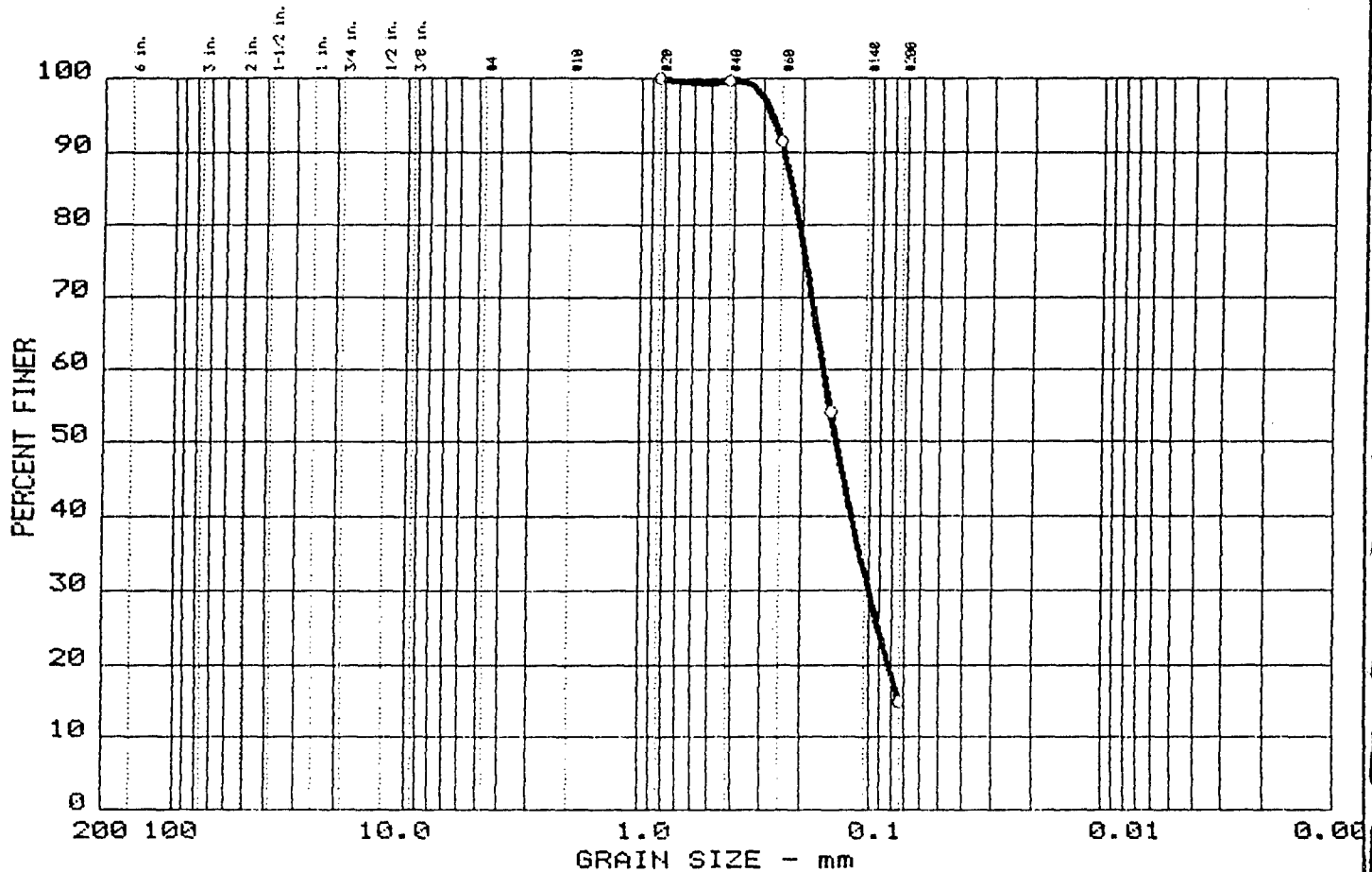
% +3"	% GRAVEL	% SAND	% FINES
0.0	0.0	90.1	9.9

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
--	--	0.33	0.22	0.20	0.146	0.0963			

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly Graded SAND with Silt	SP-SM	--

Project No.: 7005-04 Project: USATHAMA - Fort Devens: Group 1A ○ Location: Site ID - SHB-93-18B Date: March 25, 1993	Remarks: Sample ID SHB-93-037 Depth 35.0'-37.0' As rec'd w% = 20.0
GRAIN SIZE DISTRIBUTION TEST REPORT CIVILTEST LABORATORIES, INC.	CT - 1493

GRAIN SIZE DISTRIBUTION TEST REPORT



% +3"	% GRAVEL	% SAND	% FINES
0.0	0.0	85.0	15.0

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
--	--	0.22	0.16	0.14	0.101				

MATERIAL DESCRIPTION	USCS	AASHTO
0 SILT with Sand (based on grain-size)	SM	--

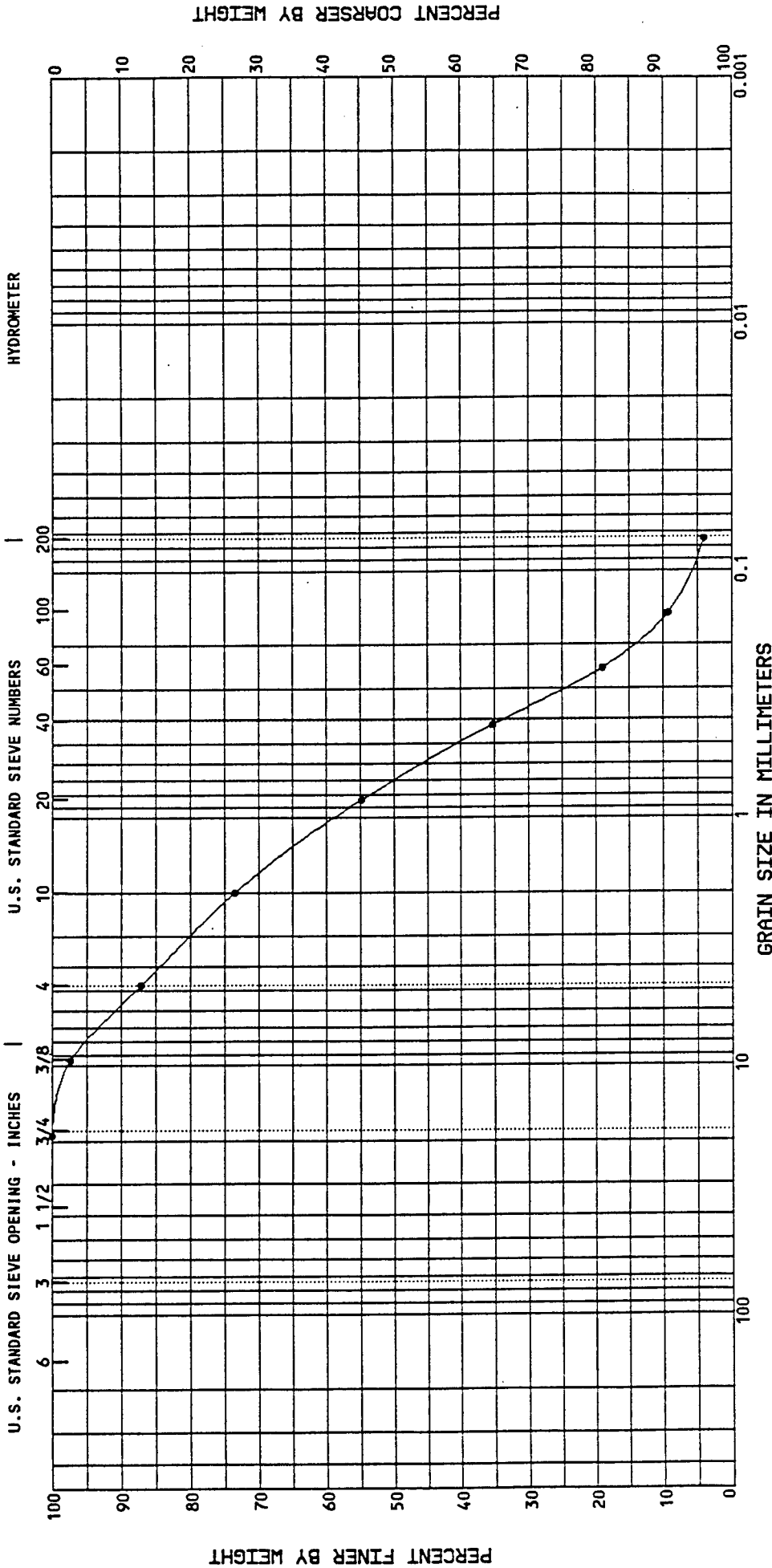
Project No.: 7005-04
 Project: USATHAMA - Fort Devens: Group 1A
 0 Location: Site ID - SHB-93-18B
 Date: March 25, 1993

Remarks:
 Sample ID SHB-93-085
 Depth 83.0'-85.0'
 As rec'd w% = 21.9

GRAIN SIZE DISTRIBUTION TEST REPORT
CIVILTEST LABORATORIES, INC.

CT - 1493

1/23/93grns292

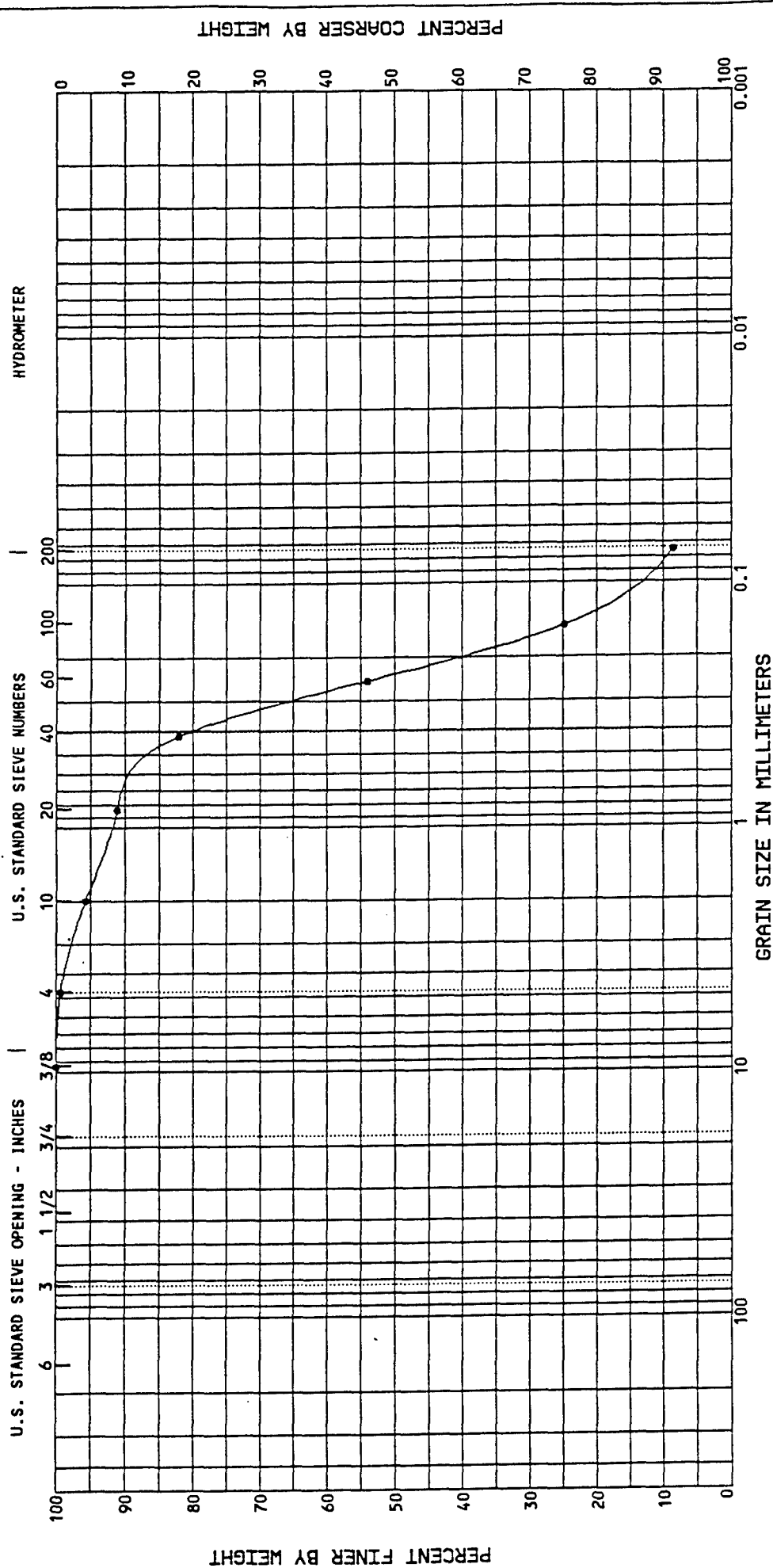


COBBLES		GRAVEL		SAND			SILT OR CLAY						
coarse		fine		coarse	medium	fine							
Specimen Identification				Classification			WC%	LL	PL	PI	Gs		
Point ID CSD9201X Depth 2.0 ft				Poorly Graded Sand SP									
				D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt	%Clay
				19.00	1.07	0.355	0.1556	0.76	6.9	13	83		4

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Project No: 39230346

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Gainesville, Florida
January 23, 1993

1/23/93grnsz92



COBBLES		GRAVEL		SAND			SILT OR CLAY							
		coarse	fine	coarse	medium	fine								
Specimen Identification		Classification								WC%	LL	PL	PI	Gs
		D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt	%Clay			
Point ID CSD9201X Depth 3.0 ft		9.50	0.28	0.164	0.0799	1.21	3.5	1	91				9	

Ft. Devens
Boston, Mass.

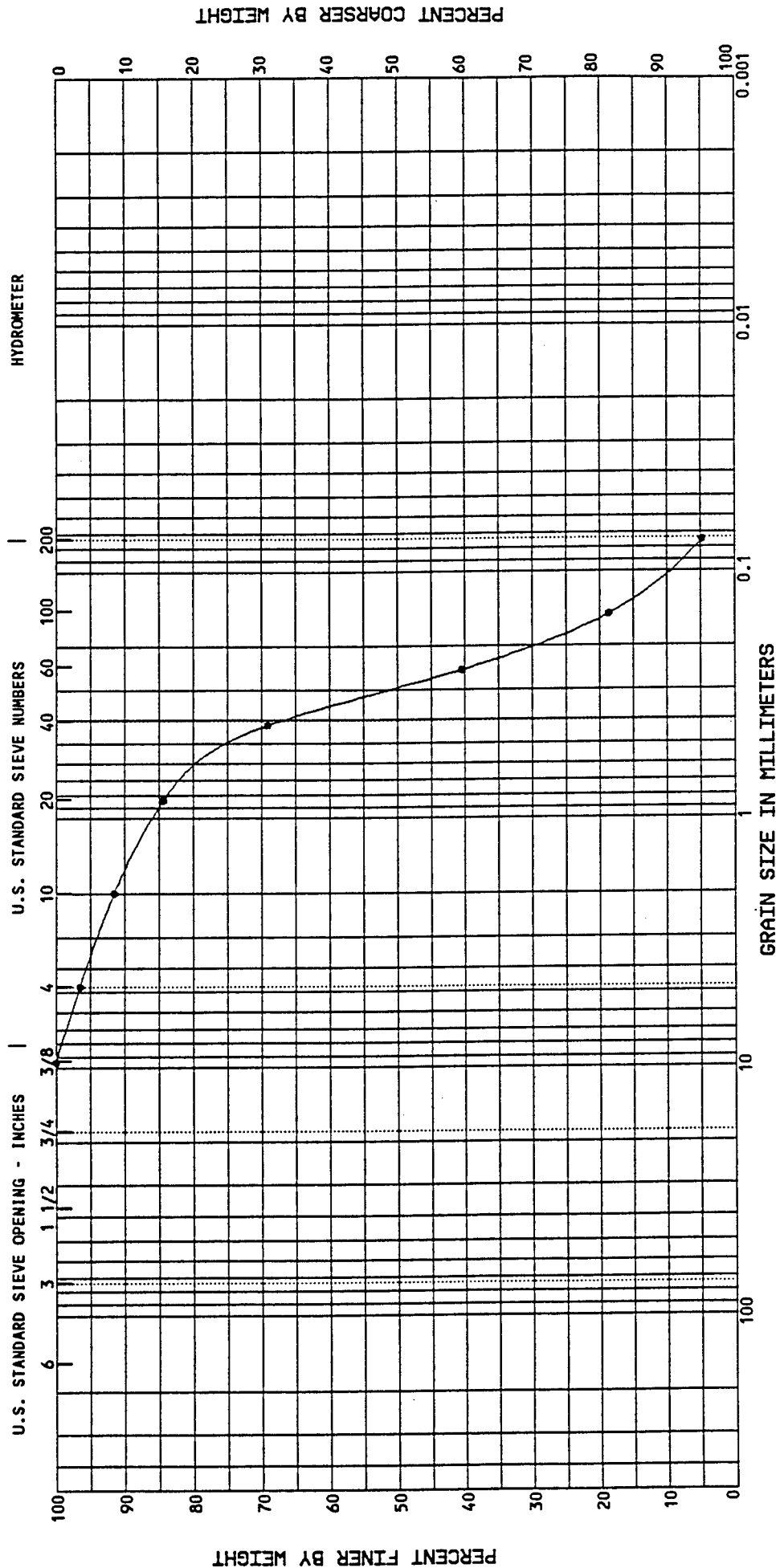
Project No: 3923034G

Environmental Science and Engineering
Gainesville, Florida

January 23, 1993

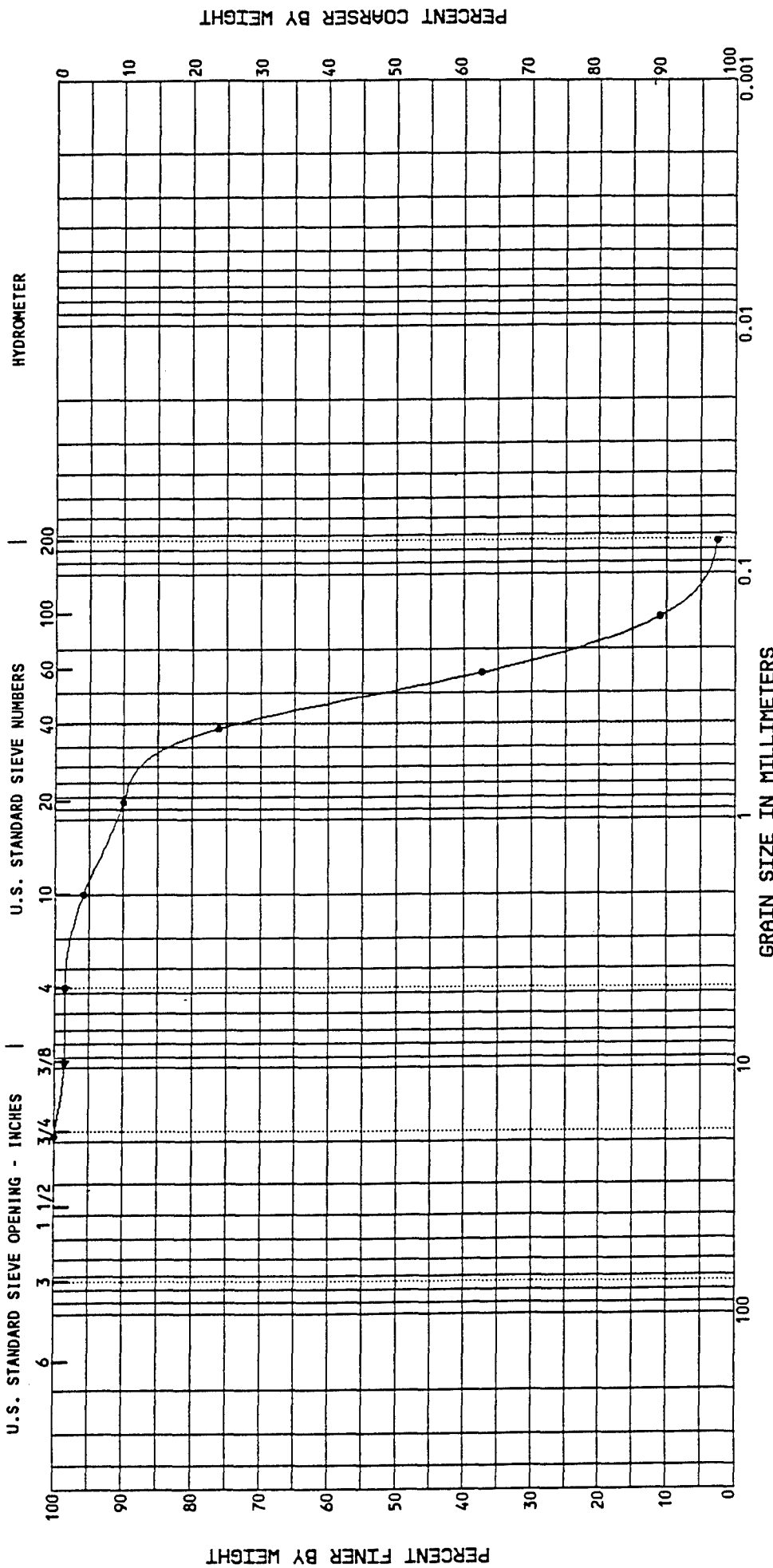
GRAIN SIZE DISTRIBUTION CURVE

1/23/93grns292



COBBLES		GRAVEL		SAND			SILT OR CLAY									
		coarse	fine	coarse	medium	fine										
Specimen Identification							Classification									
Point ID CSD9202X Depth 2.0 ft																
							D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt	%Clay
							9.50	0.36	0.196	0.0972	1.10	3.7	4	92		5
Ft. Devens Boston, Mass.							Environmental Science and Engineering Gainesville, Florida									
Project No: 3923034G							January 23, 1993									

1/23/93grnsz92



COBBLES		GRAVEL			SAND			SILT OR CLAY				
		coarse	fine		coarse	medium	fine	MC%	LL	PL	PI	Gs
Specimen Identification		Poorly Graded Sand SP										
Point ID CSD9202X Depth 4.0 ft		D100	D60	D30	D10	Cc	Cu					
		19.00	0.34	0.217	0.1381	1.00	2.4		2	96		3

Ft. Devens
 Boston, Mass.
 Project No: 3923034G

GRAIN SIZE DISTRIBUTION CURVE
 Environmental Science and Engineering
 Gainesville, Florida
 January 23, 1993

PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

U.S. STANDARD SIEVE OPENING - INCHES

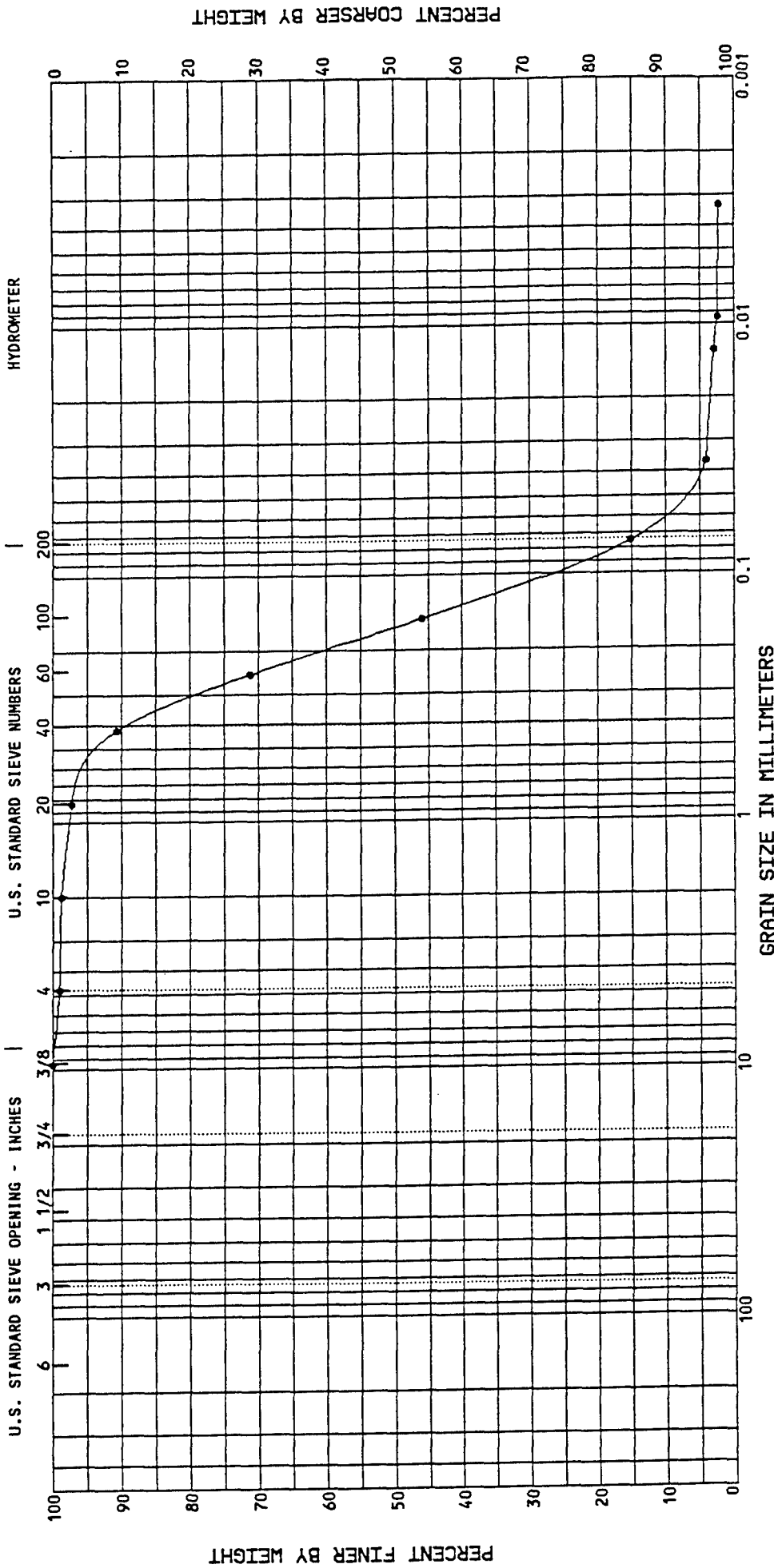
U.S. STANDARD SIEVE NUMBERS

HYDROMETER

Grain Size (mm)	U.S. Standard Sieve	Percent Finer (%)	Percent Coarser (%)
100	3/4	100	0
75	2	100	0
60	2.5	100	0
47.5	3	100	0
40	3.75	100	0
37.5	4	100	0
30	5	100	0
25	6	100	0
20	7.5	100	0
15	10	100	0
12.5	12	100	0
10	15	100	0
7.5	20	100	0
6	25	100	0
4.75	30	100	0
4	35	100	0
3.75	40	100	0
3.0	47.5	100	0
2.5	60	100	0
2.0	75	100	0
1.5	100	100	0
1.18	150	100	0
1.0	180	100	0
0.85	200	100	0
0.75	250	100	0
0.6	300	100	0
0.5	350	100	0
0.425	40	100	0
0.375	45	100	0
0.30	60	100	0
0.25	75	100	0
0.20	100	100	0
0.15	150	100	0
0.125	180	100	0
0.10	200	100	0
0.075	250	0	100

COBBLES		GRAVEL		SAND			SILT OR CLAY						
		coarse	fine	coarse	medium	fine							
Specimen Identification		Classification					WC%	LL	PL	PI	Gs		
		D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt	%Clay		
		9.50	0.21	0.104	0.0235			1	81	11	7		
Point ID CSD9203X		Depth 0.0 ft											
Ft. Devens Boston, Mass. Project No: 3923034G		GRAIN SIZE DISTRIBUTION CURVE					Environmental Science and Engineering Gainesville, Florida January 23, 1993						

1/25/93grnsz92



COBBLES		GRAVEL		SAND			SILT OR CLAY														
		coarse	fine	coarse	medium	fine															
Specimen Identification							Classification					WC%	LL	PL	PI	Gs					
Point ID CSD9203X depth 3.0 ft																					
							D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt	%Clay					
							9.50	0.20	0.105	0.0535				84	13	2					
													1								

Ft. Devens
Boston, Mass.

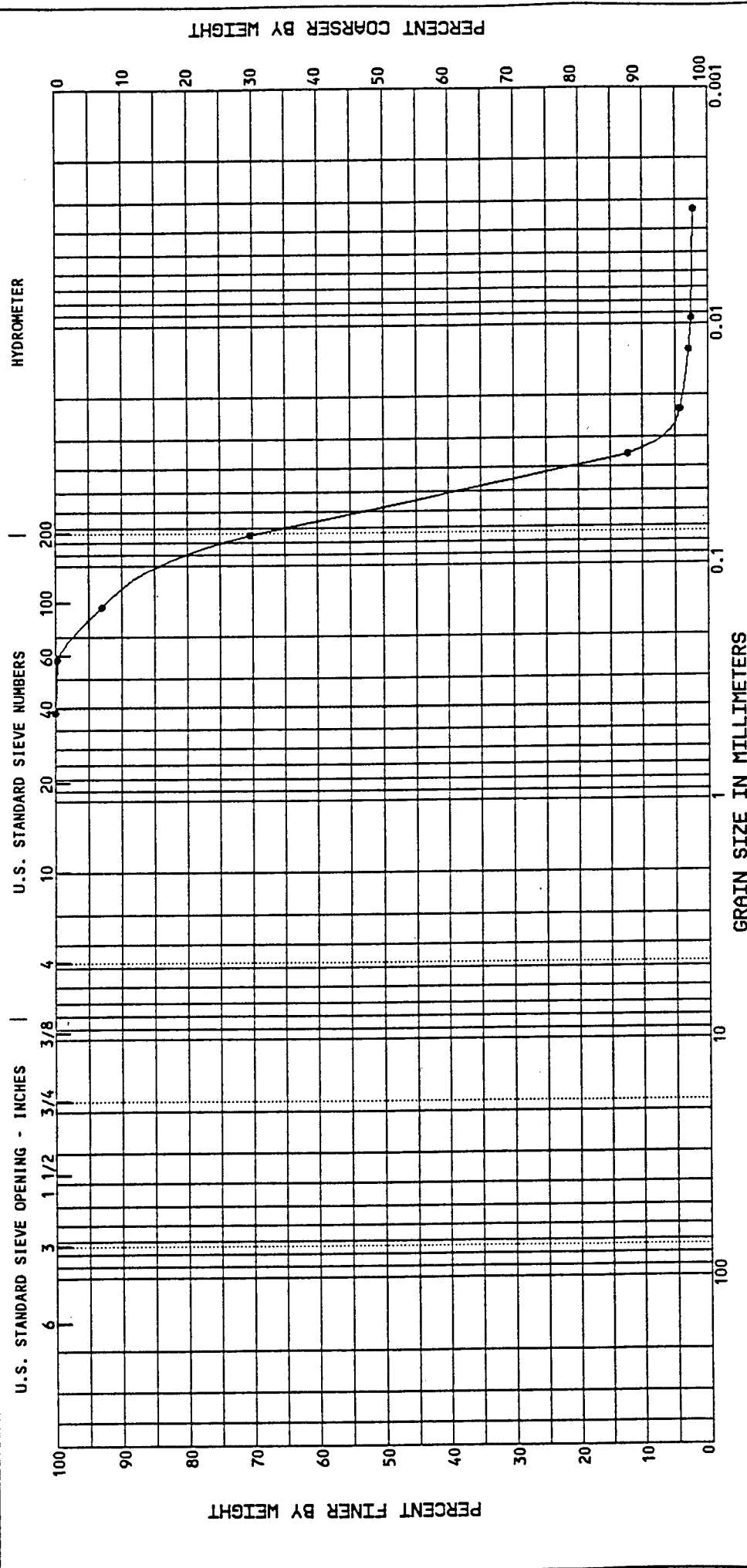
Project No: 3923034G

Environmental Science and Engineering
Gainesville, Florida

January 25, 1993

GRAIN SIZE DISTRIBUTION CURVE

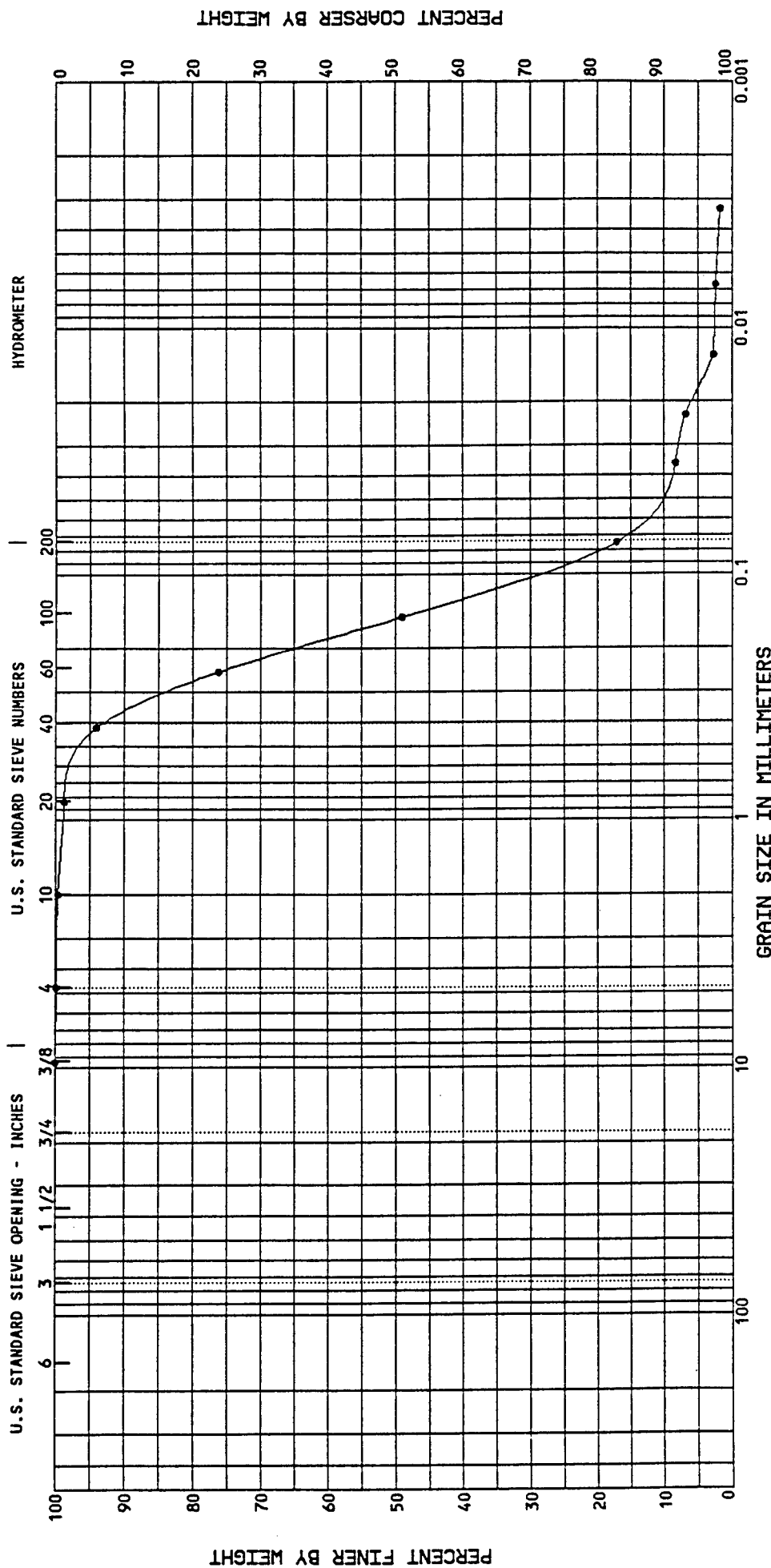
1/25/93grnsz92



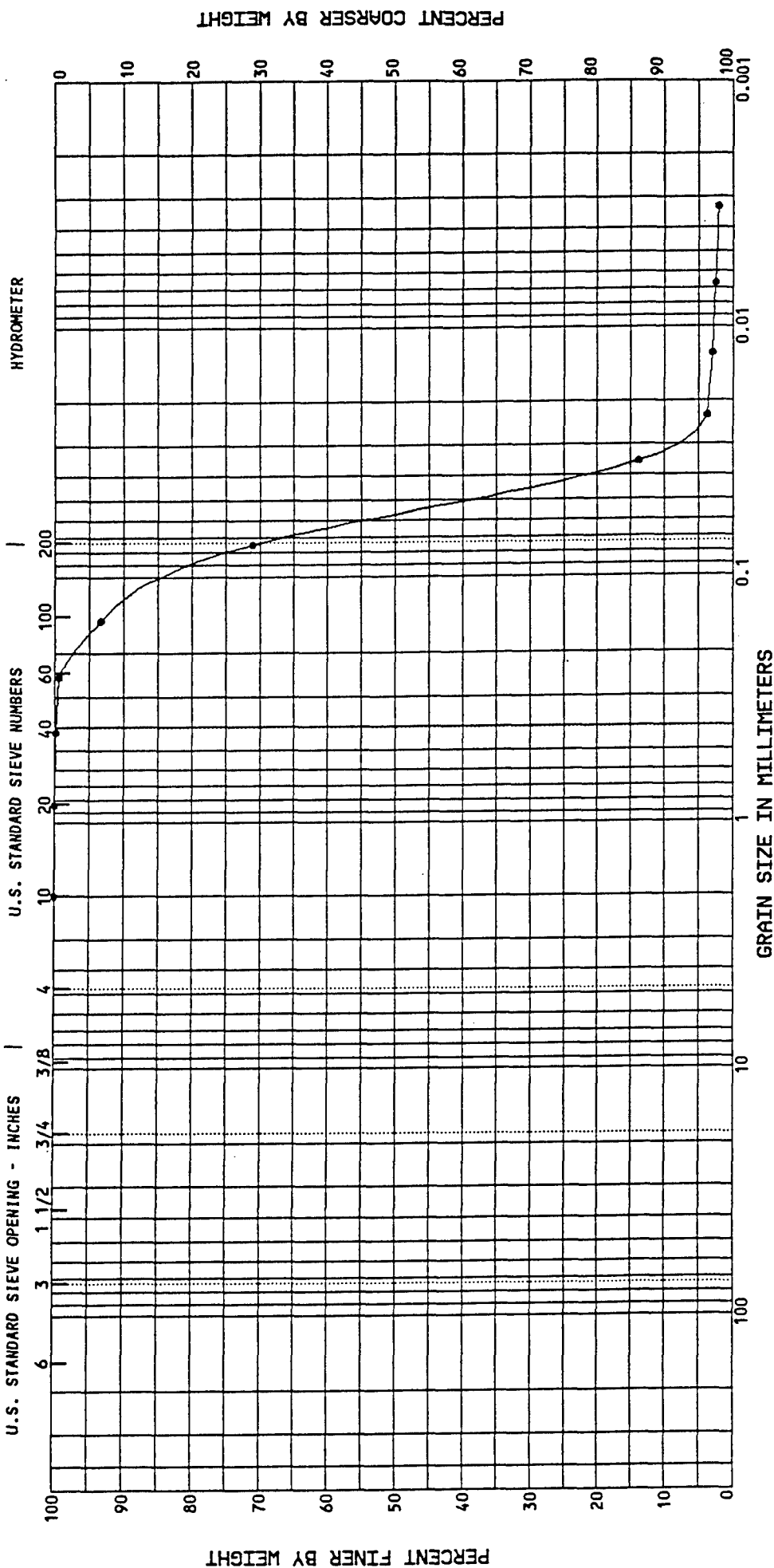
COBBLES		GRAVEL		SAND			SILT OR CLAY						
		coarse	fine	coarse	medium	fine	LL	PL	PI	Gs			
Specimen Identification		Classification									WC%		
		D100	D60	D30	D10	Cc		Cu	%Gravel	%Sand	%Silt	%Clay	
Point ID CSD9203X Depth 5.0 ft		0.42	0.07	0.045	0.0313			0	30	68	2		
Ft. Devens Boston, Mass. Project No: 39230346		GRAIN SIZE DISTRIBUTION CURVE										Environmental Science and Engineering Gainesville, Florida January 25, 1993	

COBBLES	GRAVEL		SAND			SILT OR CLAY				
	coarse	fine	coarse	medium	fine					
Point ID CSD9204X Depth 0.0 ft	Classification					WC%	LL	PL	PI	Gs
	D100	D60	D30	D10	Cc		Cu	%Gravel	%Sand	%Silt
	37.50	0.31	0.177	0.0799	1.27		3.9	12	80	9
Ft. Devens Boston, Mass.						Environmental Science and Engineering Gainesville, Florida				
Project No: 3923034G						January 23, 1993				

1/25/93grns292



1/25/93grnsz92



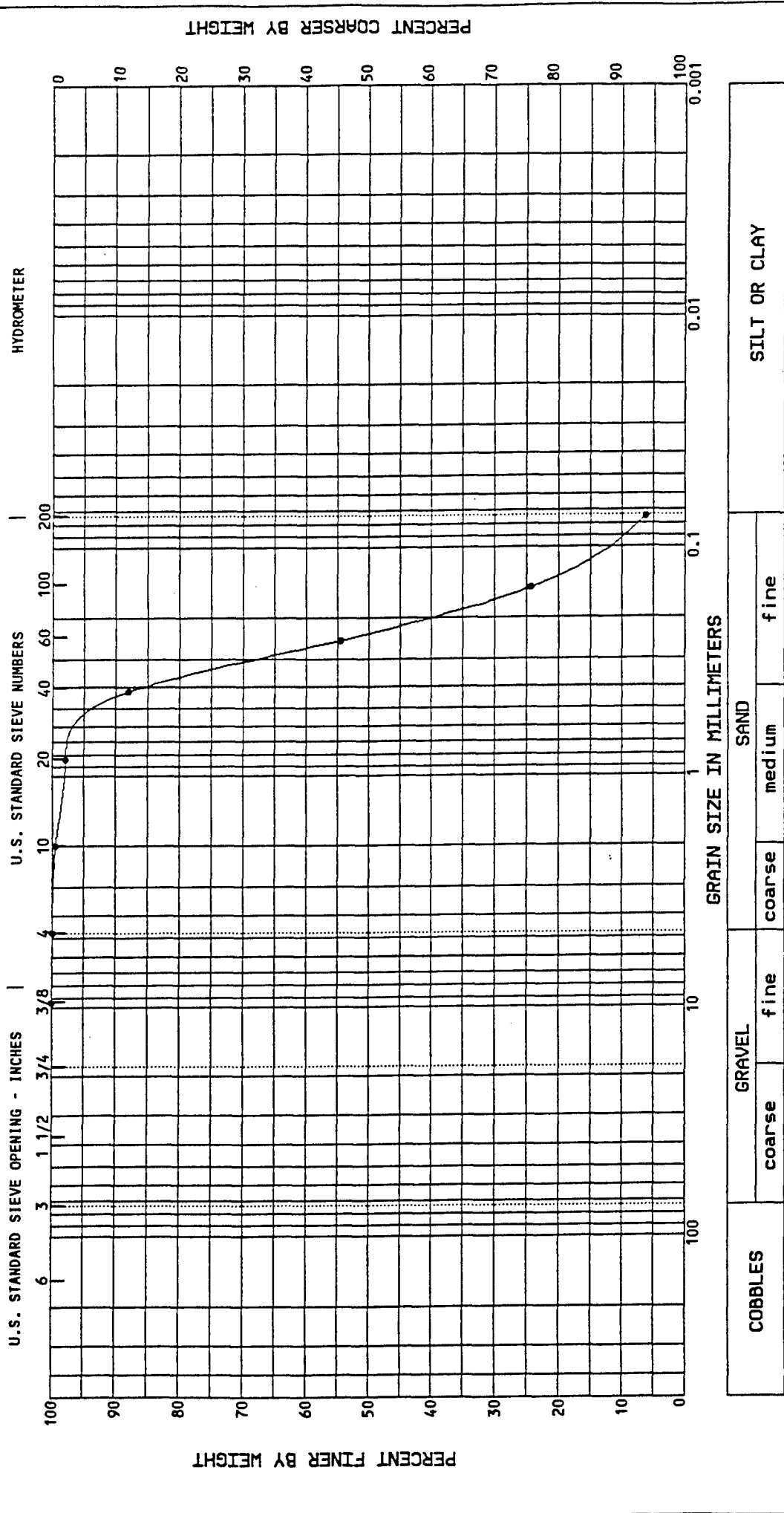
Grain Size (mm)	Percent Finer (%)
0.075	100
0.15	95
0.3	85
0.6	75
1.18	65
2.5	55
4.75	45
9.5	35
19	25
37.5	15
75	0

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Boston, Mass.
Project No: 3923034G**

GRAIN SIZE DISTRIBUTION CURVE

**Environmental Science and Engineering
Gainesville, Florida
January 23, 1993**

1/23/93grnsz92



COBBLES		GRAVEL		SAND			SILT OR CLAY					
		coarse	fine	coarse	medium	fine						
Specimen Identification		Classification						WC%	LL	PL	PI	Gs
Point ID CSD9205X Depth 2.0 ft												
		D100	D60	D30	D10	Cc	Cu					
		9.50	0.27	0.165	0.0865	1.16	3.1					
									0	94		6

Ft. Devens

Boston, Mass.

Project No: 3923034G

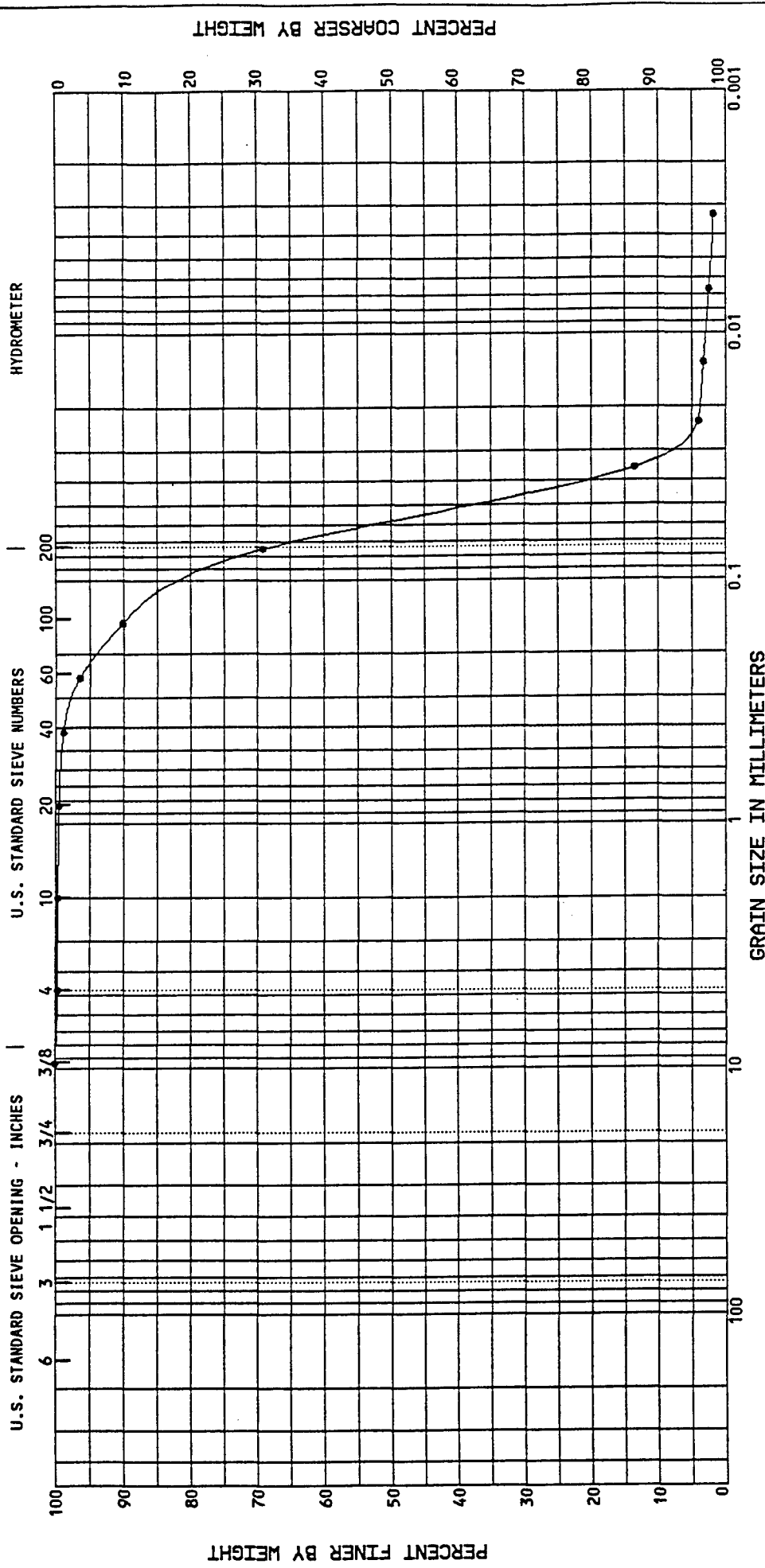
GRAIN SIZE DISTRIBUTION CURVE

Environmental Science and Engineering

Gainesville, Florida

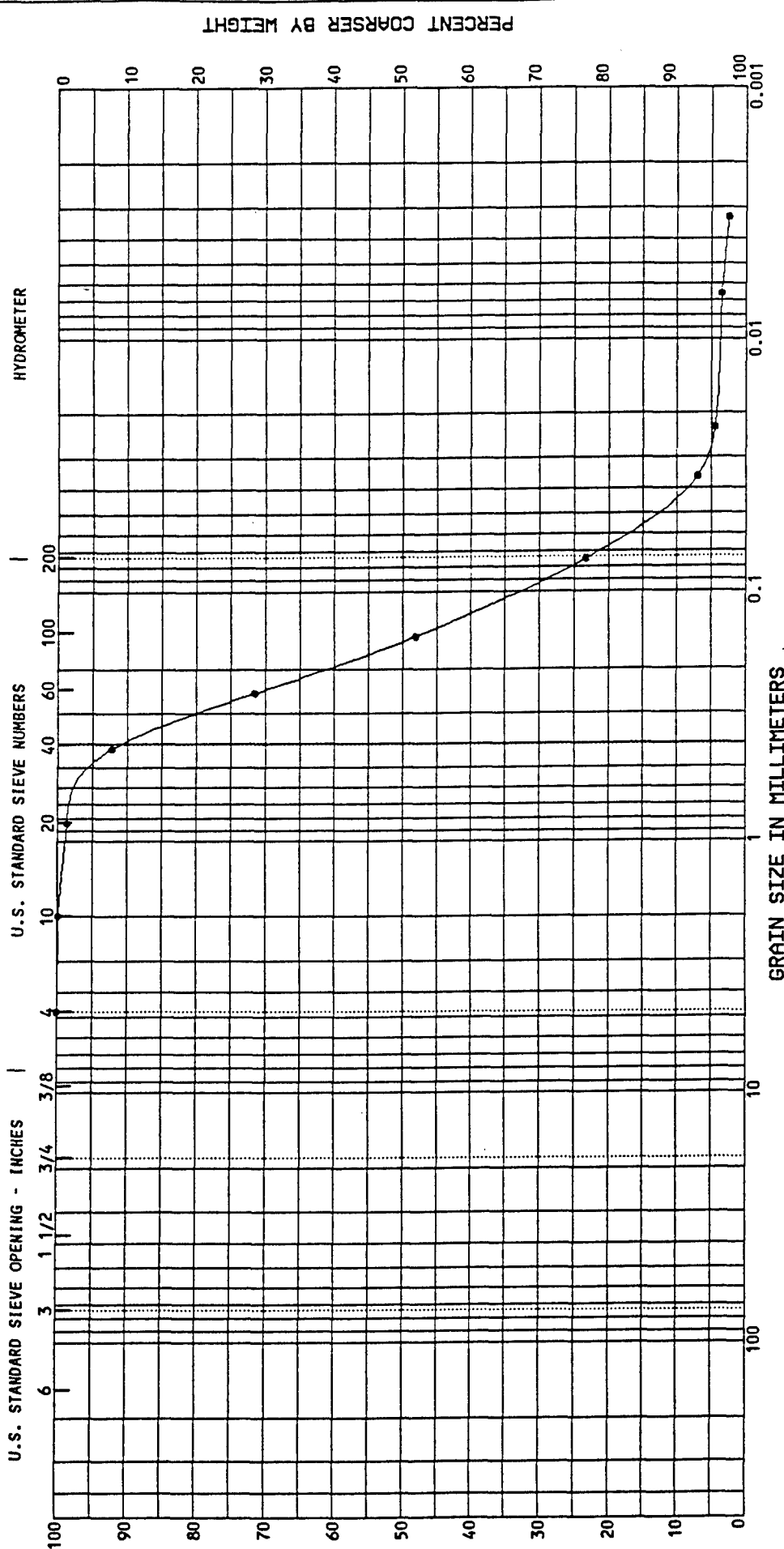
January 23, 1993

1/25/93grnsz92



COBBLES			GRAVEL			SAND			SILT OR CLAY				
			coarse	fine		coarse	medium	fine					
Specimen Identification			Classification						LL	PL	PI	Gs	
Point ID CSD9205X Depth 4.0 ft													
D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt	%Clay				
9.50	0.07	0.044	0.0303			0	31	67	2				

1/25/93grnsz92



COBBLES	GRAVEL		SAND			SILT OR CLAY				
	coarse	fine	coarse	medium	fine	MC%	LL	PL	PI	Gs
Specimen Identification										
Point ID CSD9206X Depth 0.0 ft										
Classification										
D100		D60	D30	D10	Cc	Cu	%Gravel		%Sand	%Silt
4.75		0.19	0.090	0.0412			0		77	20
										3

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Project No: 3023034G

GRAIN SIZE DISTRIBUTION CURVE

Environmental Science and Engineering
Gainesville, Florida

January 25, 1993

[illegible]

COBBLES		GRAVEL		SAND			SILT OR CLAY							
		coarse	fine	coarse	medium	fine								
Specimen Identification		Classification					MC%	LL	PL	PI	Gs			
		D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt	%Clay			
Point ID CSD9206X	Depth 2.0 ft					19.00	0.21	0.093	0.0467		2	76	20	2

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Boston, Mass.
Project No: 3923034G

GRAIN SIZE DISTRIBUTION CURVE

Environmental Science and Engineering
Gainesville, Florida
January 25, 1993

The graph illustrates the relationship between sieve size and the percentage of material finer or coarser by weight. The x-axis is divided into two scales: U.S. Standard Sieve Numbers (top, linear scale from 10 to 200) and U.S. Standard Sieve Opening in Inches (bottom, logarithmic scale from 1/8 to 100). The y-axis is divided into two scales: Percent Finer by Weight (left, 0 to 100) and Percent Coarser by Weight (right, 100 to 0). A single curve is plotted, representing the cumulative distribution of the material.

Sieve Size (Inches)	Sieve Number	Percent Finer (%)	Percent Coarser (%)
1/8	20	~100	~0
3/16	30	~95	~5
1/4	40	~90	~10
5/16	60	~85	~15
3/8	80	~80	~20
1/2	100	~75	~25
3/4	160	~65	~35
1	200	~55	~45
1 1/2	280	~45	~55
2	320	~35	~65
2 1/2	360	~25	~75
3	40	~15	~85
3 1/2	45	~10	~90
4	50	~5	~95
4 1/2	56	~2	~98
5	60	~1	~99
5 1/2	66	~0.5	~99.5
6	70	~0.2	~99.8
6 1/2	75	~0.1	~99.9
7	80	~0.05	~99.95
7 1/2	85	~0.02	~99.98
8	90	~0.01	~99.99
8 1/2	95	~0.005	~99.995
9	100	~0.002	~99.998
9 1/2	105	~0.001	~99.999
10	110	~0.0005	~99.9995
10 1/2	115	~0.0002	~99.9998
11	120	~0.0001	~99.9999
11 1/2	125	~0.00005	~99.99995
12	130	~0.00002	~99.99998
12 1/2	135	~0.00001	~99.99999
13	140	~0.000005	~99.999995
13 1/2	145	~0.000002	~99.999998
14	150	~0.000001	~99.999999
14 1/2	155	~0.0000005	~99.9999995
15	160	~0.0000002	~99.9999998
15 1/2	165	~0.0000001	~99.9999999
16	170	~0.00000005	~99.99999995
16 1/2	175	~0.00000002	~99.99999998
17	180	~0.00000001	~99.99999999
17 1/2	185	~0.000000005	~99.999999995
18	190	~0.000000002	~99.999999998
18 1/2	195	~0.000000001	~99.999999999
19	200	~0.0000000005	~99.9999999995
19 1/2	205	~0.0000000002	~99.9999999998
20	210	~0.0000000001	~99.9999999999
20 1/2	215	~0.00000000005	~99.99999999995
21	220	~0.00000000002	~99.99999999998
21 1/2	225	~0.00000000001	~99.99999999999
22	230	~0.000000000005	~99.999999999995
22 1/2	235	~0.000000000002	~99.999999999998
23	240	~0.000000000001	~99.999999999999
23 1/2	245	~0.0000000000005	~99.9999999999995
24	250	~0.0000000000002	~99.9999999999998
24 1/2	255	~0.0000000000001	~99.9999999999999
25	260	~0.00000000000005	~99.99999999999995
25 1/2	265	~0.00000000000002	~99.99999999999998
26	270	~0.00000000000001	~99.99999999999999
26 1/2	275	~0.000000000000005	~99.999999999999995
27	280	~0.000000000000002	~99.999999999999998
27 1/2	285	~0.000000000000001	~99.999999999999999
28	290	~0.0000000000000005	~99.9999999999999995
28 1/2	295	~0.0000000000000002	~99.9999999999999998
29	300	~0.0000000000000001	~99.9999999999999999
29 1/2	305	~0.00000000000000005	~99.99999999999999995
30	310	~0.00000000000000002	~99.99999999999999998
30 1/2			

Point ID	CSP9206X	Depth 4.0 ft	COBBLES		GRAVEL		SAND			SILT OR CLAY				
			coarse	fine	coarse	fine	coarse	medium	fine	LL	PL	PI	Gs	
														Classification
			D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt	%Clay		
			2.00	0.07	0.039	0.0226			0	32	64	4		

**Ft. Devens
Boston, Mass.**

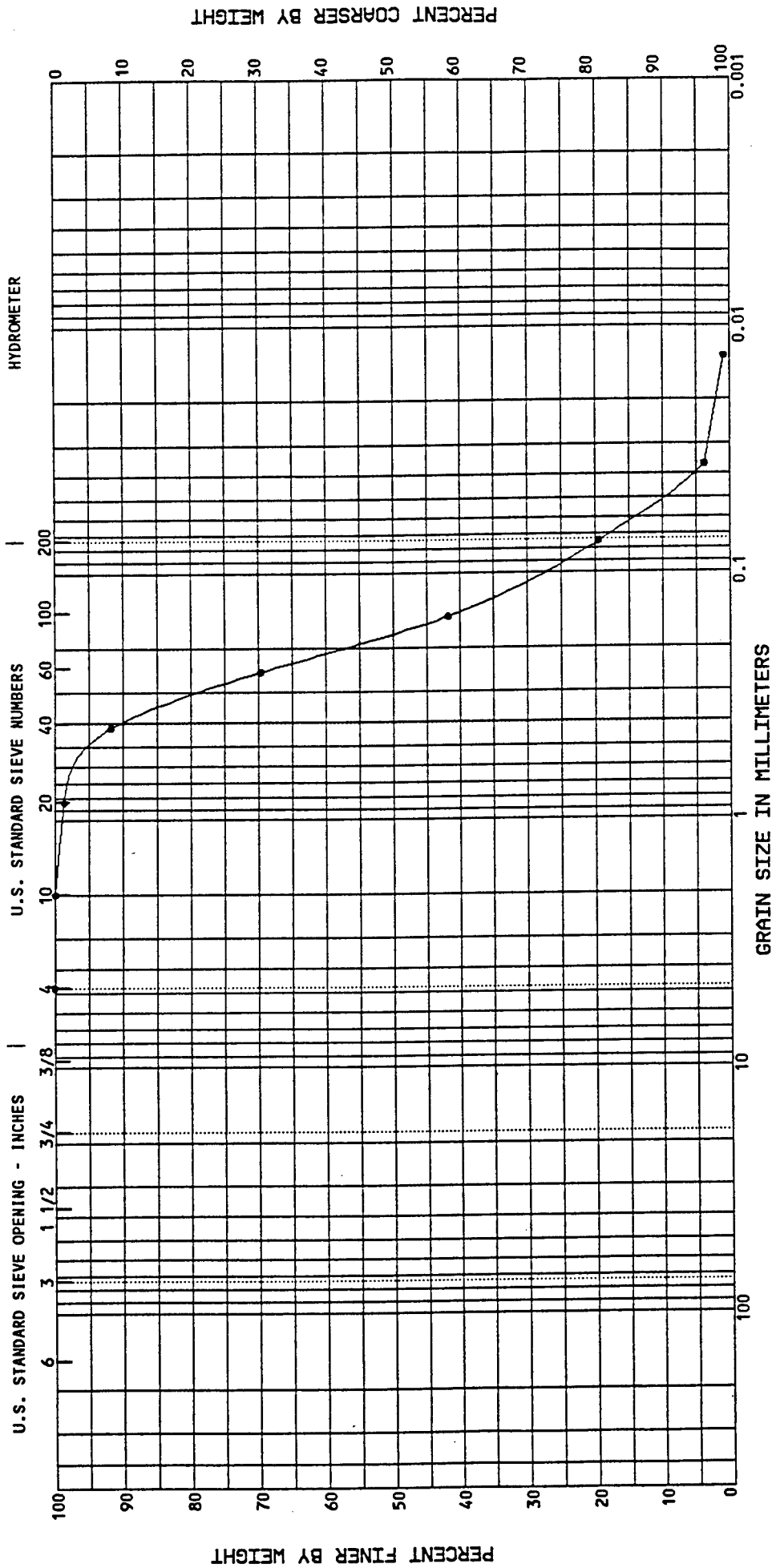
GRAIN SIZE DISTRIBUTION CURVE

**Environmental Science and Engineering
Gainesville, Florida**

Project No: 3923034g

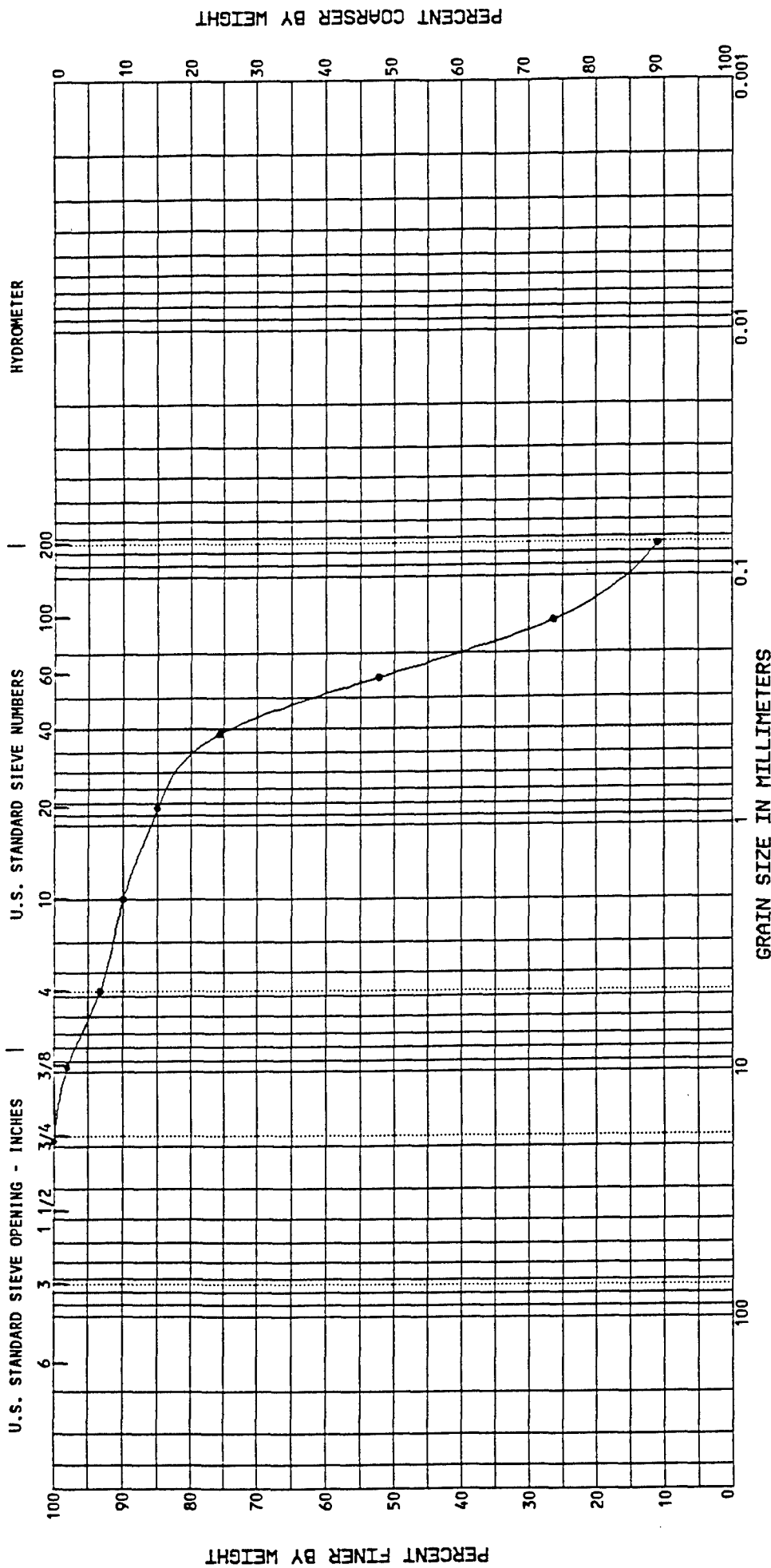
January 23, 1993

1/25/93grnsz92



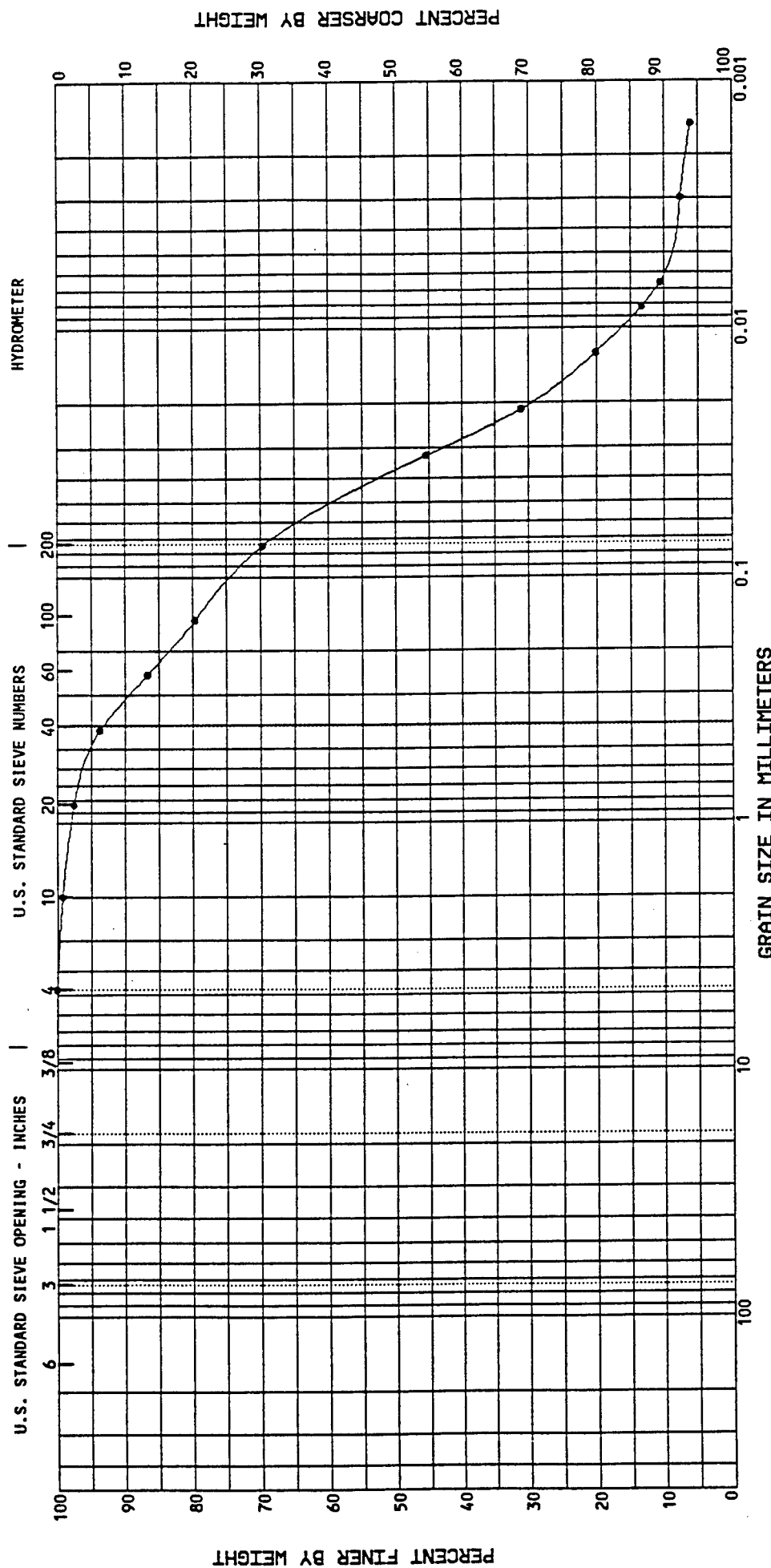
COBBLES		GRAVEL		SAND			SILT OR CLAY					
		coarse	fine	coarse	medium	fine						
Specimen Identification		Classification					WC%	LL	PL	PI	Gs	
Point ID CSD9210X	Depth 0.0 ft	D100	D60	D30	D10	Cc		Cu	%Gravel	%Sand	%Silt	%Clay
		4.75	0.21	0.104	0.0486				0	81		20
Ft. Devens Boston, Mass. Project No: 3923034G		GRAIN SIZE DISTRIBUTION CURVE					Environmental Science and Engineering Gainesville, Florida January 25, 1993					

1/23/93grnsz92

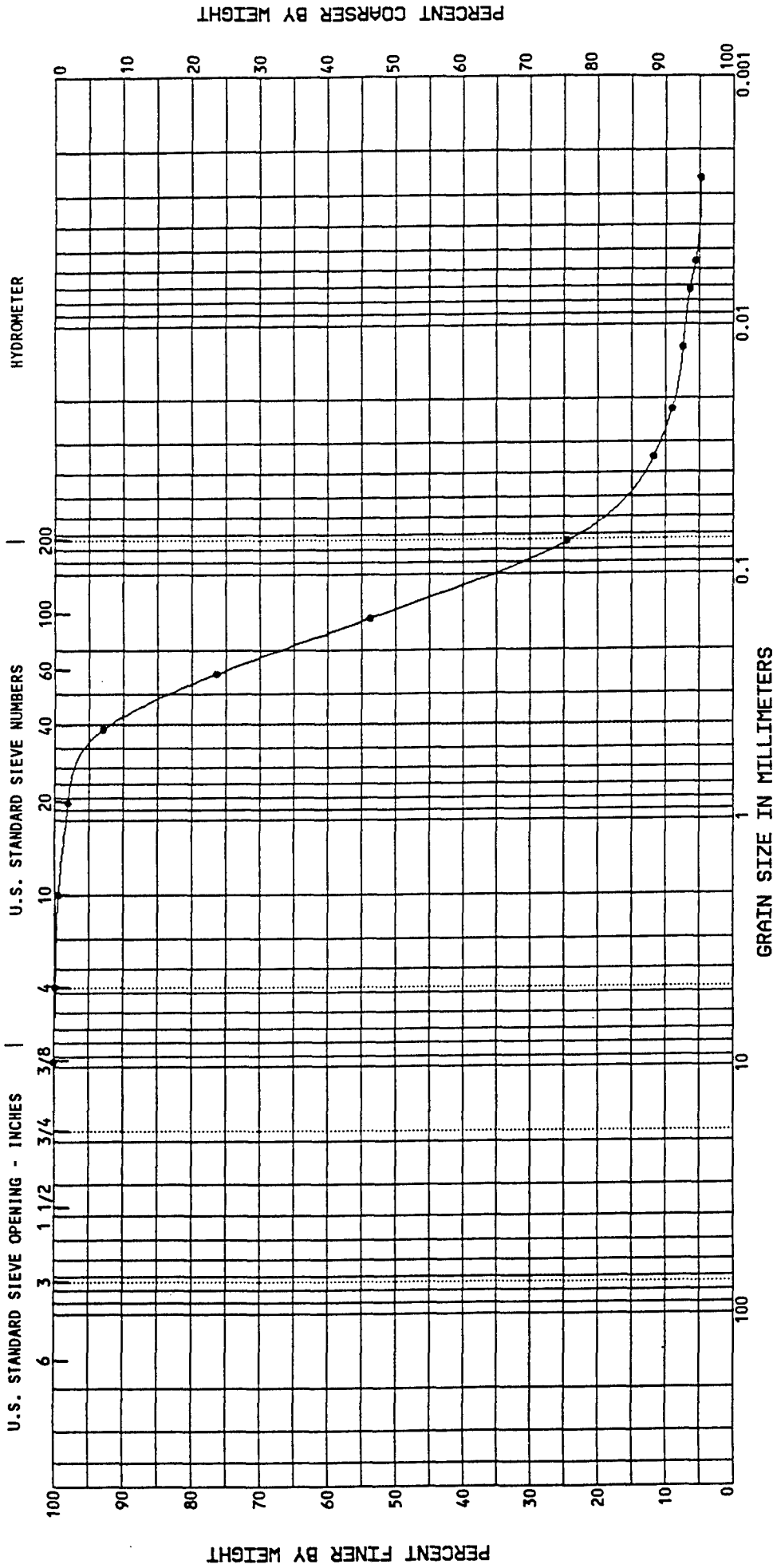


COBBLES	GRAVEL		SAND			SILT OR CLAY				
	coarse	fine	coarse	medium	fine	WC%	LL	PL	PI	Gs
Specimen Identification										
Point ID CS09210X Depth 2.0 ft										
D100			D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt
19.00			0.30	0.161		1.25	4.2	7	82	11
GRAIN SIZE DISTRIBUTION CURVE										
Ft. Devens Boston, Mass.						Environmental Science and Engineering Gainesville, Florida				
Project No: 7023034G						January 23, 1993				

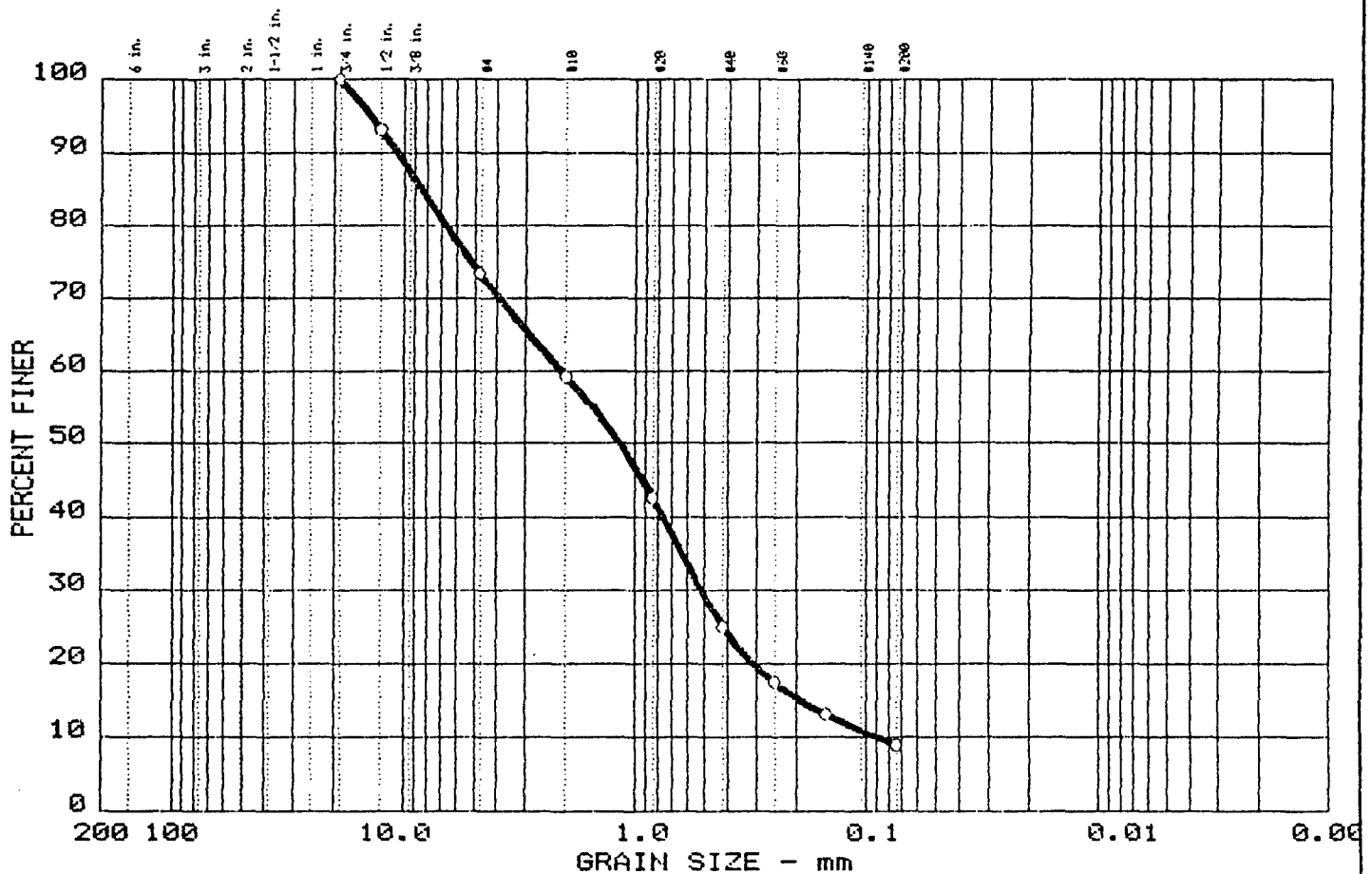
1/23/93grns292



1/23/93grns292



GRAIN SIZE DISTRIBUTION TEST REPORT



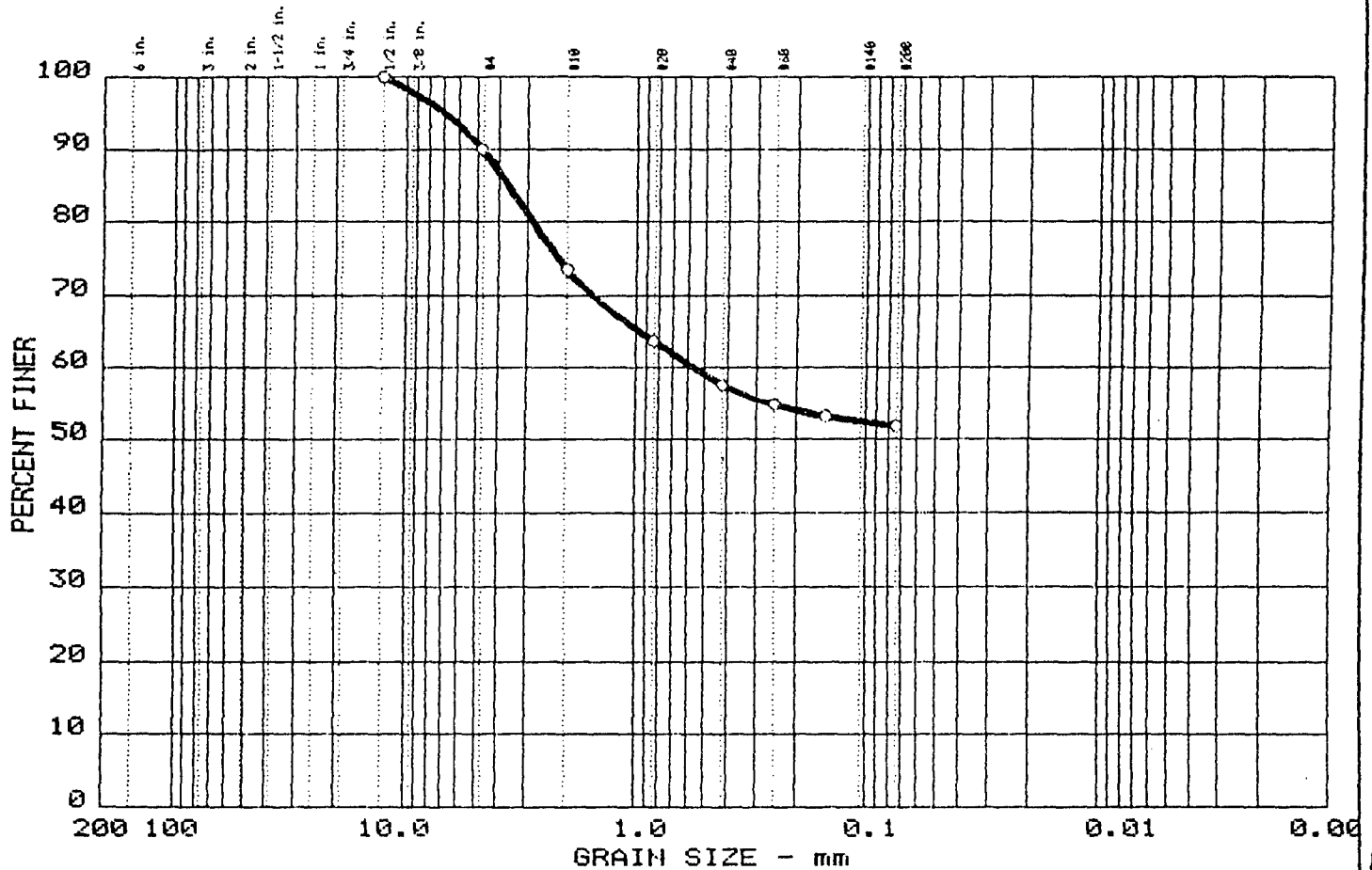
% +3"	% GRAVEL	% SAND	% FINES
0.0	26.6	64.5	8.9

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
--	--	8.41	2.07	1.17	0.518	0.1903	0.0890	1.48	23.5

MATERIAL DESCRIPTION	USCS	AASHTO
Well Graded SAND with Gravel and Silt	SW-SM	--

Project No.: 7005-04 Project: USATHAMA - Fort Devens: Group 1A Location: Site ID - CSB-93-01A Date: March 25, 1993	Remarks: Sample ID CSB-93-026 Depth 24.0'-26.0' As rec'd w% = 14.2
GRAIN SIZE DISTRIBUTION TEST REPORT CIVILTEST LABORATORIES, INC.	CT - 1493

GRAIN SIZE DISTRIBUTION TEST REPORT



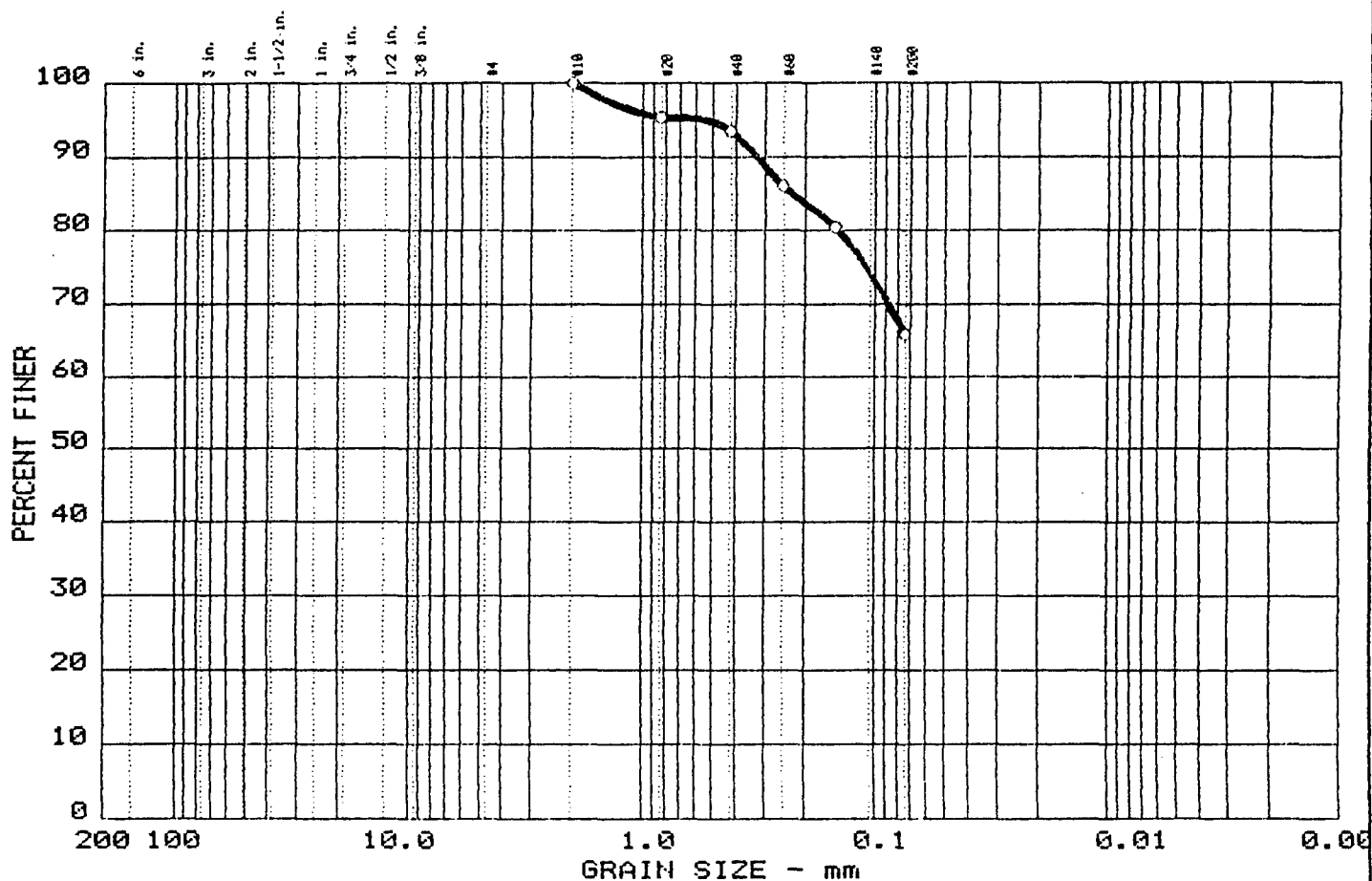
% +3"	% GRAVEL	% SAND	% FINES
0.0	10.0	38.3	51.7

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
--	--	3.59	0.56						

MATERIAL DESCRIPTION	USCS	AASHTO
0 Sandy SILT (based on grain-size)	ML	--

Project No.: 7005-04 Project: USATHAMA - Fort Devens: Group 1A Location: Site ID - CSB-93-01A Date: March 25, 1993	Remarks: Sample ID CSB-93-038 Depth 36.5'-38.5' As rec'd w% = 215.0 some (+) Organics
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CT - 1493	

GRAIN SIZE DISTRIBUTION TEST REPORT



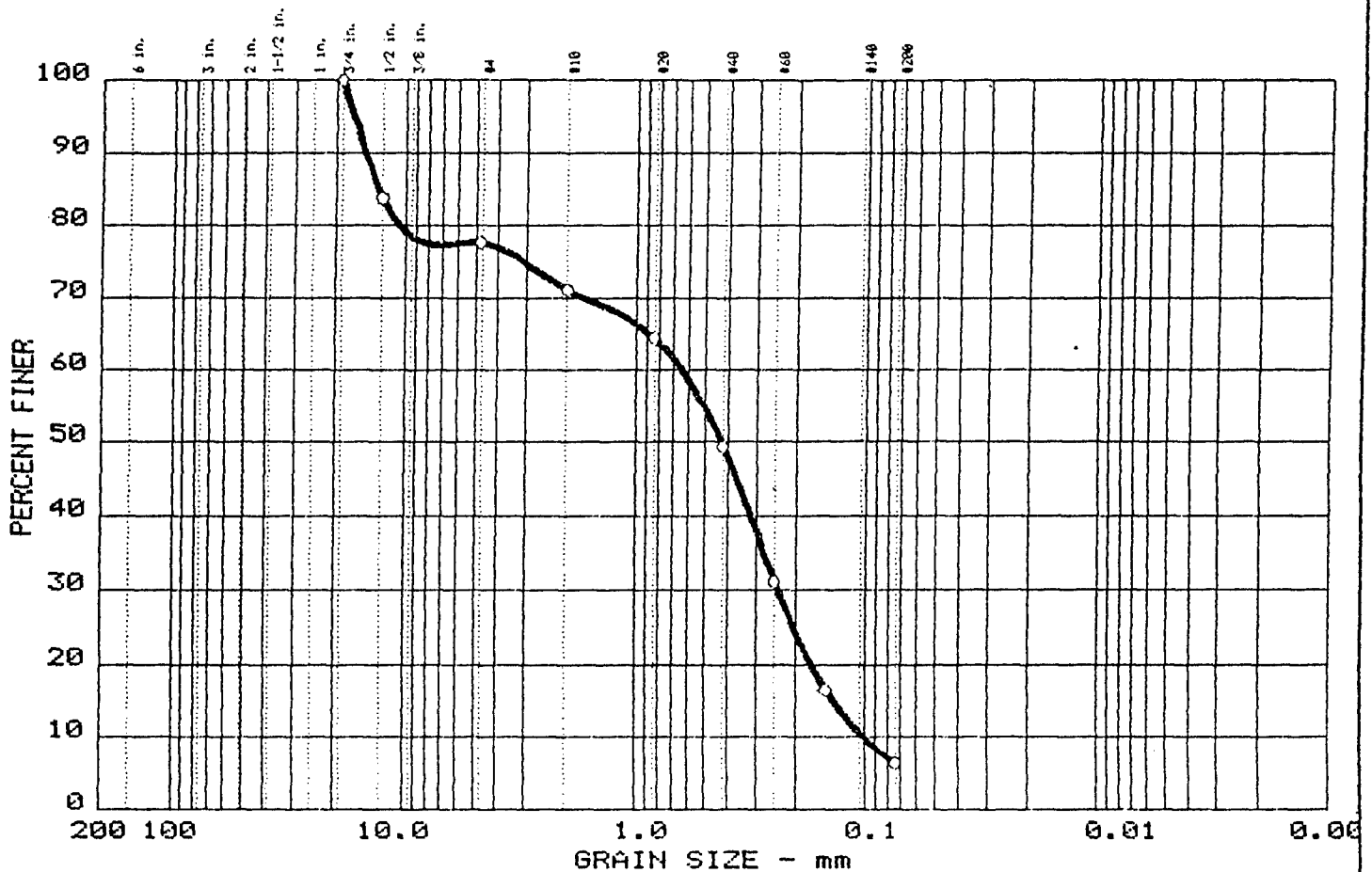
% +3"	% GRAVEL	% SAND	% FINES
0.0	0.0	34.1	65.9

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
--	--	0.23							

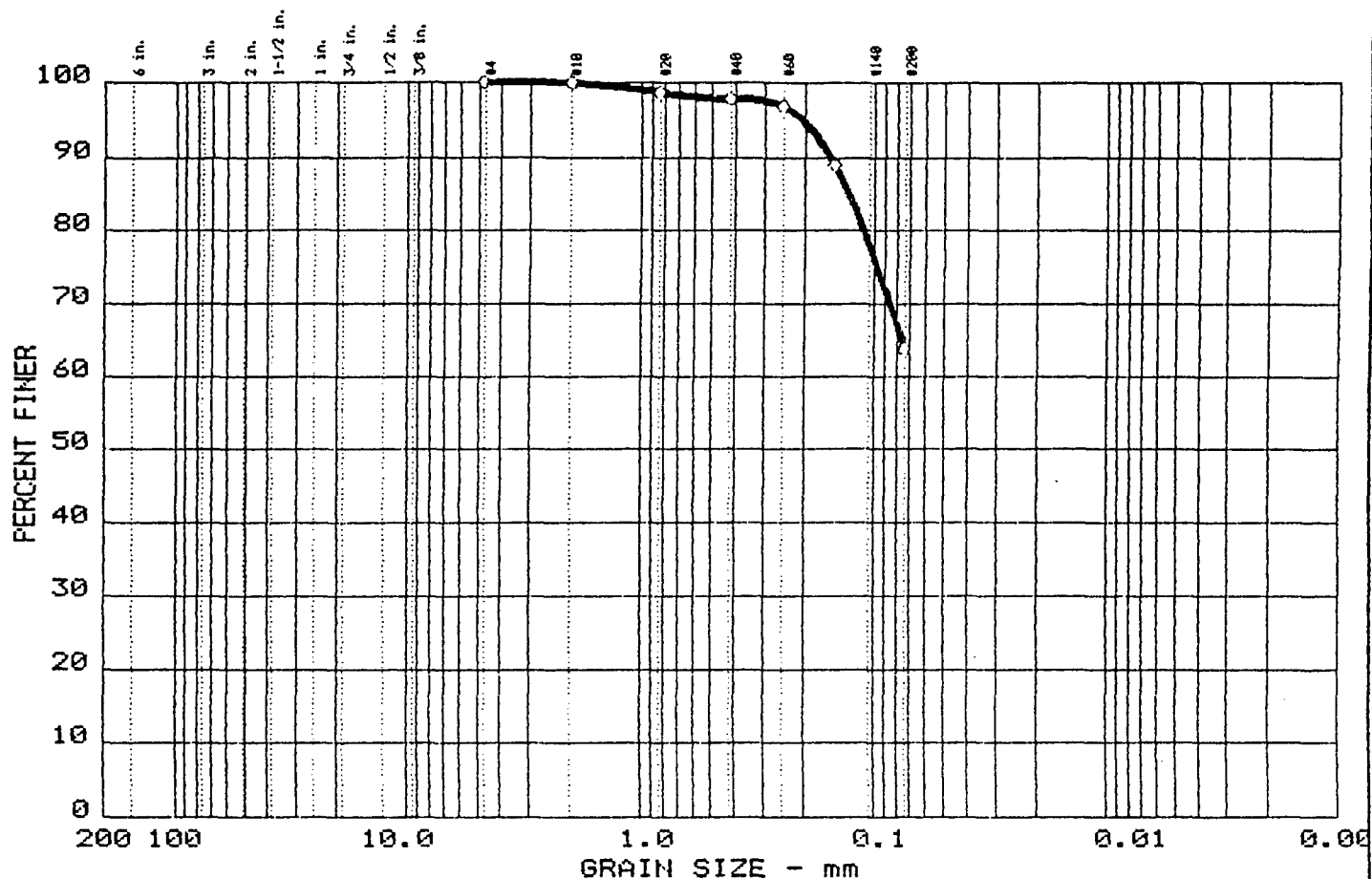
MATERIAL DESCRIPTION	USCS	AASHTO
○ Sandy SILT (based on grain-size)	ML	--

Project No.: 7005-04 Project: USATHAMA - Fort Devens: Group 1A ○ Location: Site ID - CSB-93-01A Date: March 25, 1993	Remarks: Sample ID CSB-93-044 Depth 42.5'-44.5' As rec'd w% = 80.8
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GRAIN SIZE DISTRIBUTION TEST REPORT



GRAIN SIZE DISTRIBUTION TEST REPORT



% +3"	% GRAVEL	% SAND	% FINES
0.0	0.0	36.1	63.9

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
--	--	0.13							

MATERIAL DESCRIPTION	USCS	AASHTO
○ Sandy SILT (based on grain-size)	ML	--

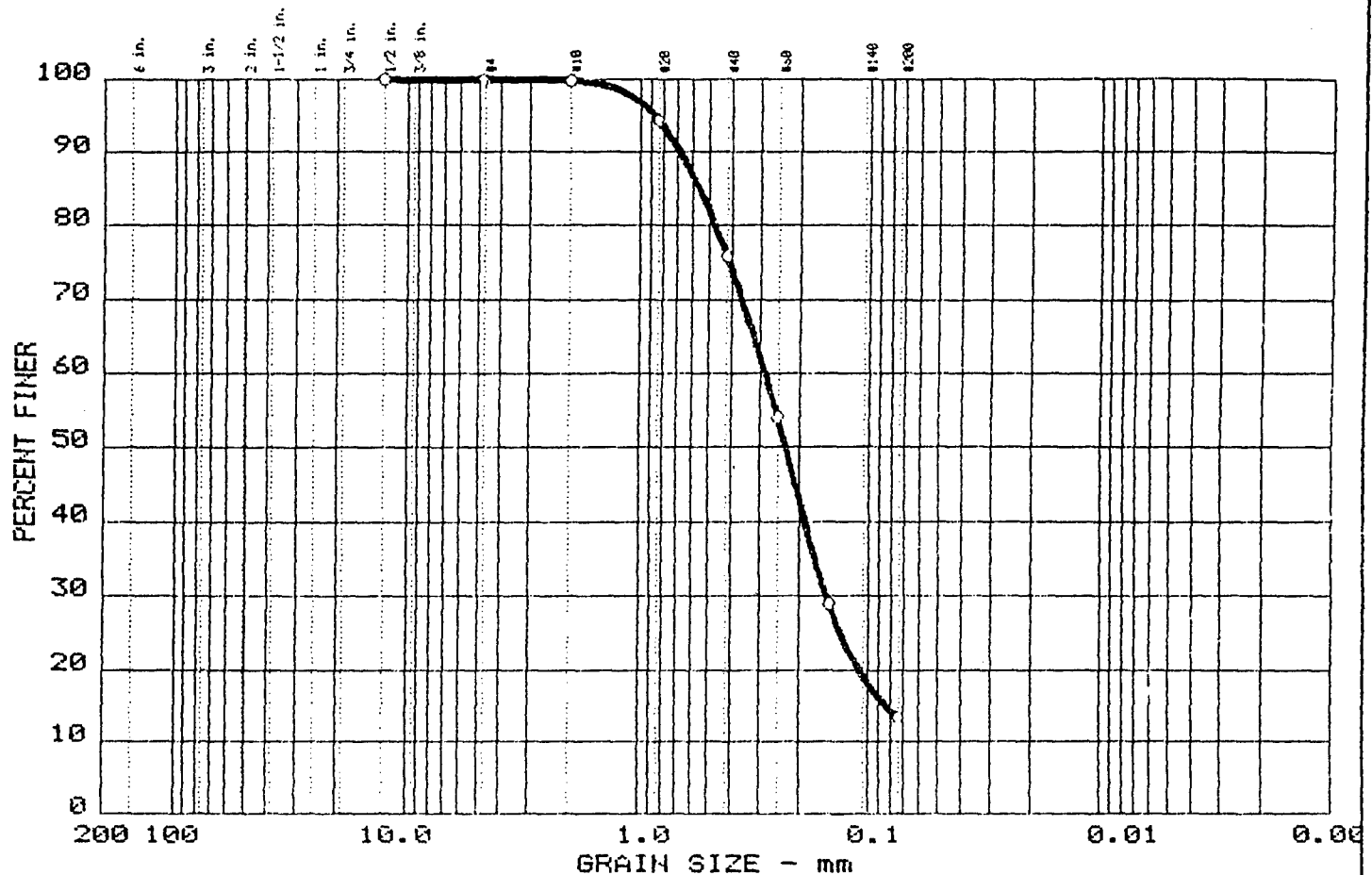
Project No.: 7005-04
 Project: USATHAMA - Fort Devens: Group 1A
 ○ Location: Site ID - CSB-93-01A
 Date: March 25, 1993

Remarks:
 Sample ID CSB-93-061
 Depth 59.0'-61.0'
 As rec'd w% = 21.6

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GRAIN SIZE DISTRIBUTION TEST REPORT



% +3"	% GRAVEL	% SAND	% FINES
0.0	0.1	86.5	13.4

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
--	--	0.56	0.28	0.23	0.153	0.0820			

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty SAND	SM	--

Project No.: 7005-04
 Project: USATHAMA - Fort Devens: Group 1A
 ○ Location: Site ID - CSB-93-02B

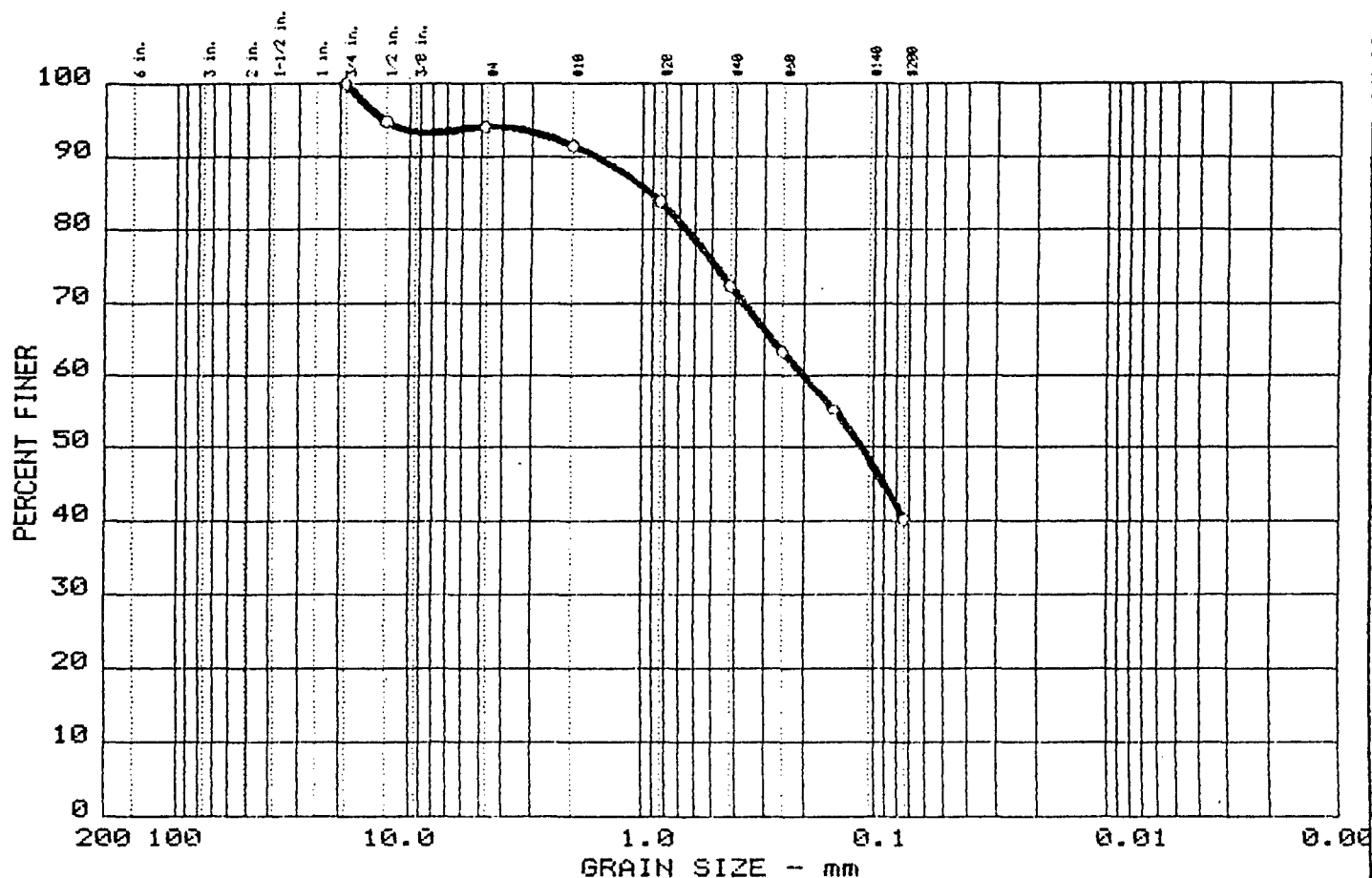
Date: March 25, 1993

Remarks:
 Sample ID CSB-93-032
 Depth 30.0'-32.0'
 As rec'd w% = 17.2

GRAIN SIZE DISTRIBUTION TEST REPORT
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GRAIN SIZE DISTRIBUTION TEST REPORT



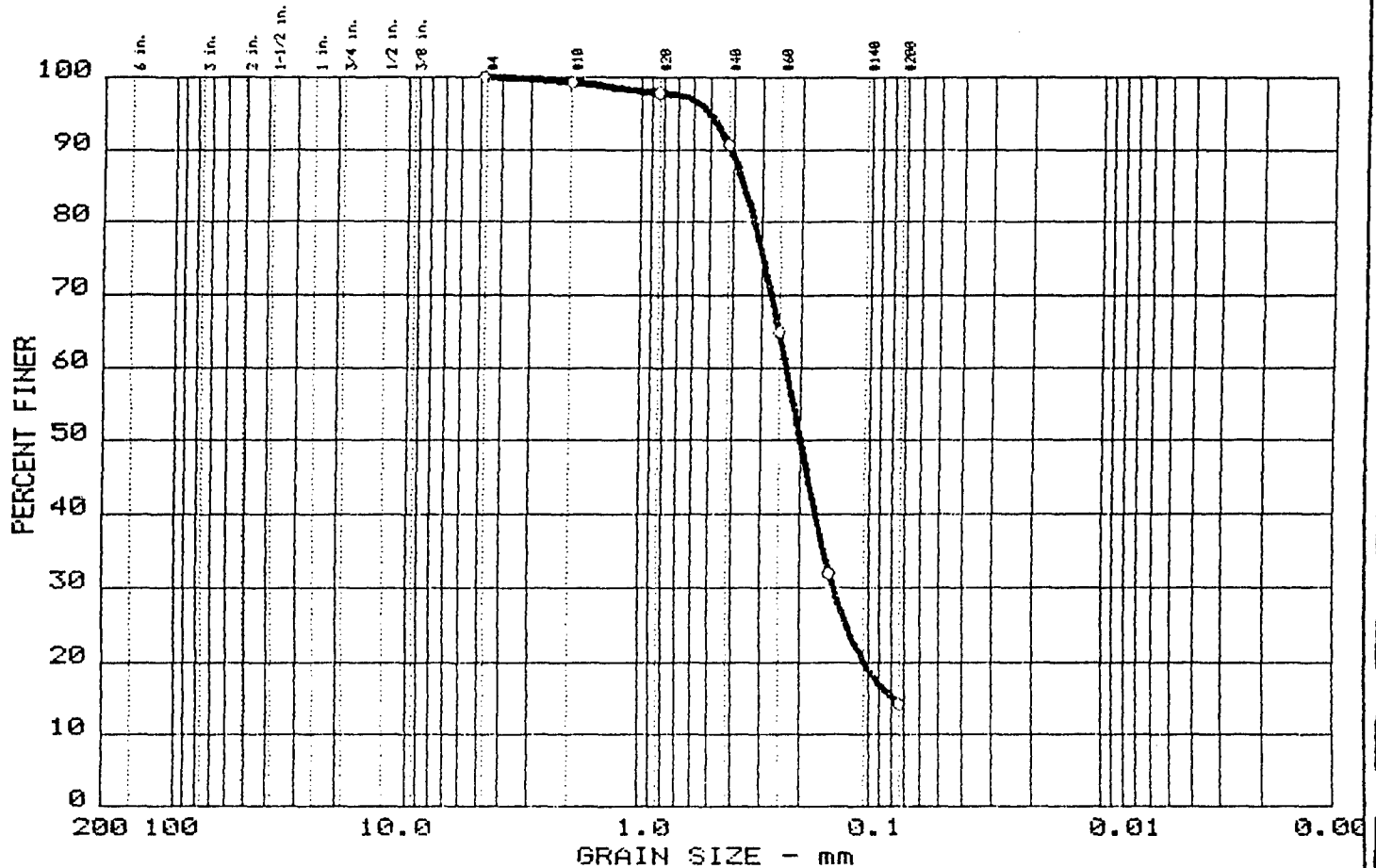
% +3"	% GRAVEL	% SAND	% FINES
0.0	5.9	53.8	40.3

LL	PI	D ₂₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
--	--	0.91	0.20	0.11					

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty SAND	SM	--

Project No.: 7005-04 Project: USATHAMA - Fort Devens: Group 1A ○ Location: Site ID - CSB-93-02B Date: March 25, 1993	Remarks: Sample ID CSB-93-042 Depth 40.0'-42.0' As rec'd w% = 13.9
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GRAIN SIZE DISTRIBUTION TEST REPORT



% +3"	% GRAVEL	% SAND	% FINES
0.0	0.0	85.7	14.3

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
--	--	0.36	0.23	0.20	0.143	0.0775			

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty SAND	SM	--

Project No.: 7005-04
 Project: USATHAMA - Fort Devens: Group 1A
 ○ Location: Site ID - CSB-93-02B

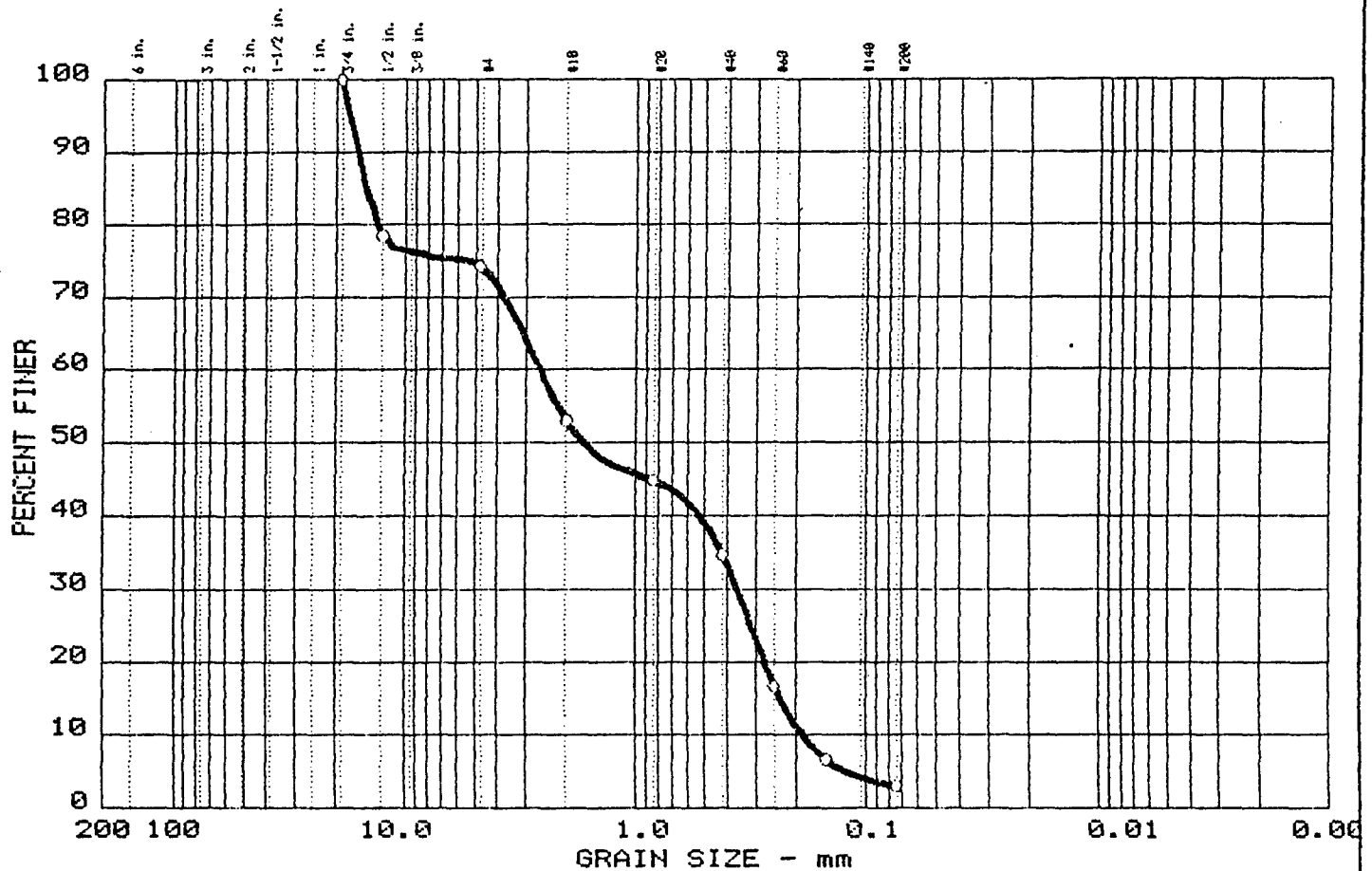
 Date: March 25, 1993

Remarks:
 Sample ID CSB-93-082
 Depth 80.0'-82.0'
 As rec'd w% = 19.1

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 CIVILTEST LABORATORIES, INC.

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GRAIN SIZE DISTRIBUTION TEST REPORT



% +3"	% GRAVEL	% SAND	% FINES
0.0	25.7	71.2	3.1

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
--	--	14.95	2.62	1.69	0.363	0.2360	0.1875	0.27	13.9

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly Graded SAND with Gravel	SP	--

Project No.: 7005-04
 Project: USATHAMA - Fort Devens: Group 1A
 ○ Location: Site ID - CSB-93-02B

Date: March 25, 1993

Remarks:
 Sample ID CSB-93-117
 Depth 110-112/115-117
 As rec'd w% = 100.0

GRAIN SIZE DISTRIBUTION TEST REPORT
CIVILTEST LABORATORIES, INC.

CT - 1493

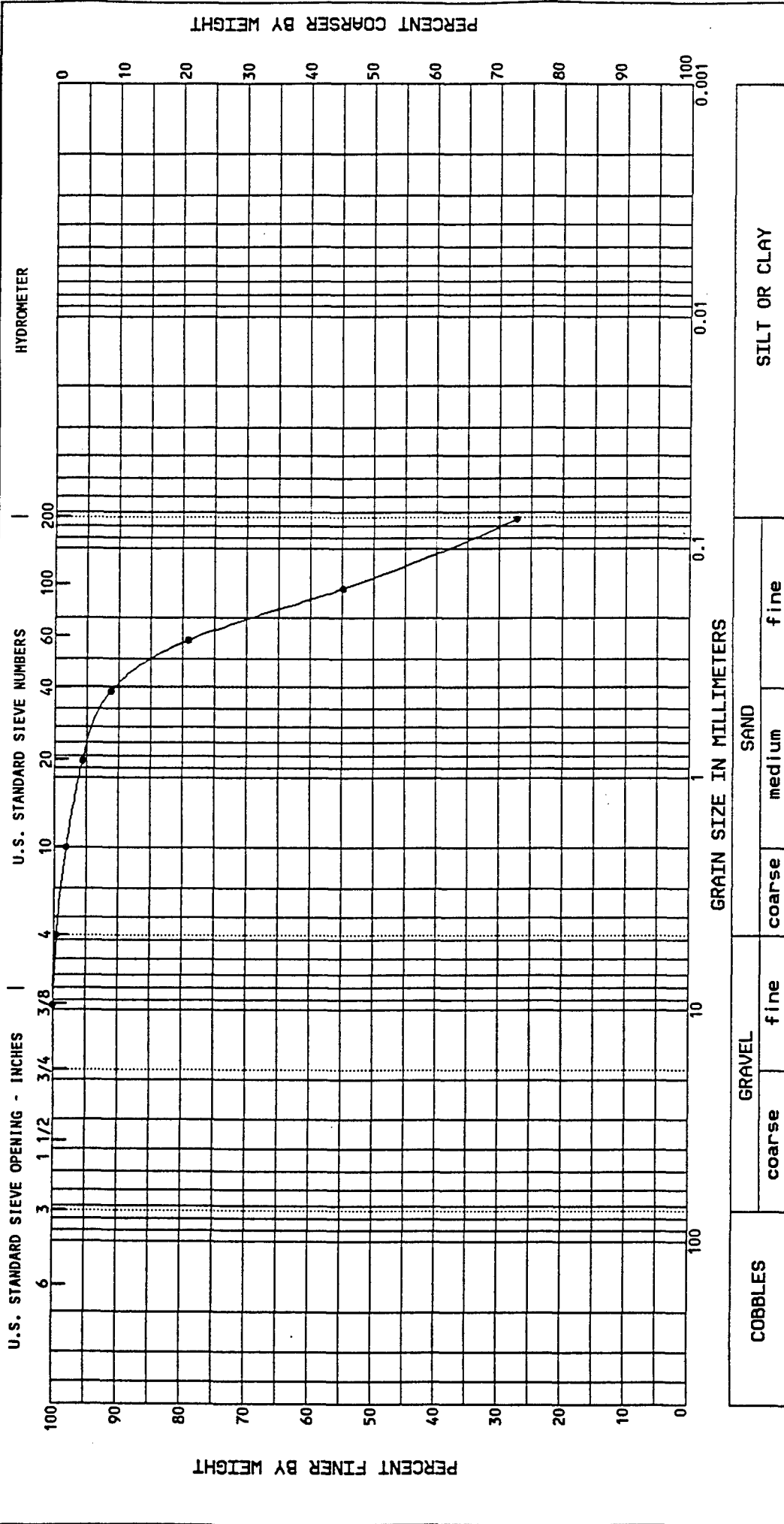
COBBLES		GRAVEL		SAND			SILT OR CLAY				
		coarse	fine	coarse	medium	fine					
Specimen Identification							WC%	LL	PL	PI	Gs
Point ID MAD9202X Depth 0.0 ft											
D100	D60	D30	D10	Cc	Cu		%Gravel	%Sand	%Silt	%Clay	
37.50	1.76	0.309		0.77	25.1		34	54		12	

**Environmental Science and Engineering
Gainesville, Florida
January 23, 1993**

Project No: 3023034G

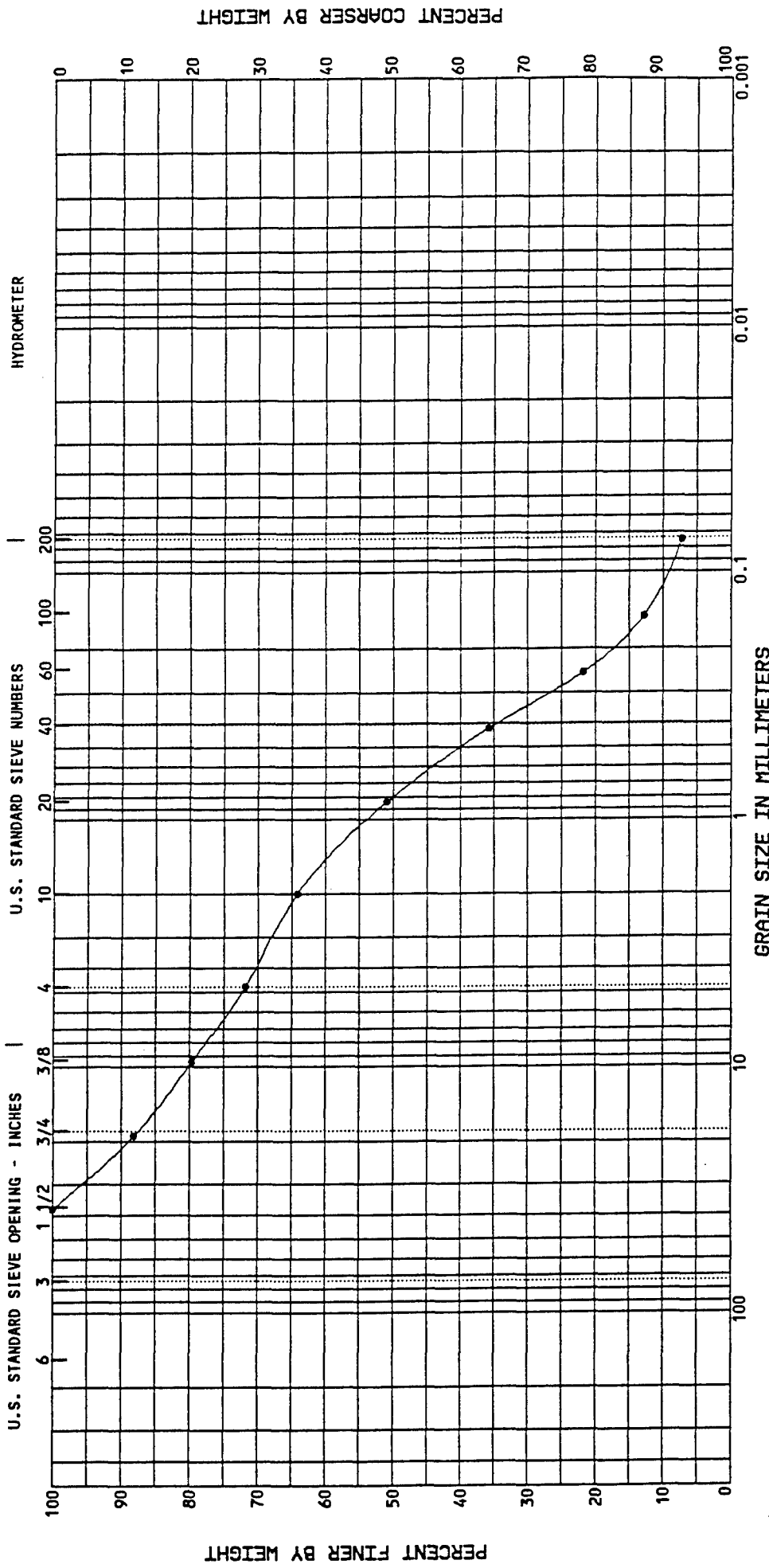
January 23, 1993

1/23/93grnsz92



Specimen Identification		Classification				WC%	LL	PL	PI	Gs	
Point ID GRW9201X	Depth 0.0 ft										
		D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt	%Clay
		9.50	0.17	0.080				1	72		27
Ft. Devens Boston, Mass. Project No: 3923034G		GRAIN SIZE DISTRIBUTION CURVE									Environmental Science and Engineering Gainesville, Florida January 23, 1993

1/23/93grns192



COBBLES		GRAVEL		SAND			SILT OR CLAY							
		coarse	fine	coarse	medium	fine	LL	PL	PI	Gs				
Specimen Identification		Classification									MC%	Cu	%Gravel	%Sand
		D100	D80	D30	D10	Cc								
		37.50	1.53	0.339	0.1061	0.71		14.4	28	65			7	
Point ID GRW9204X	Depth 0.0 ft													

SYNOPTIC WATER-LEVEL MEASUREMENTS

ABB Environmental Services, Inc.

TABLE E-1
SYNOPTIC WATER - LEVEL MEASUREMENTS
REMEDIAL INVESTIGATION ADDENDUM REPORT
FEASIBILITY STUDY FOR GROUP 1A SITES
FORT DEVENS, MA

STATION/ WELL NO.	REF. POINT	ELEV. OF REF. PT.	MAY 26, 1992			SEPT. 15, 1992			DECEMBER 22, 1992			MARCH 30, 1993 *			JUNE 22, 1993		
			DEPTH TO WATER	ELEV. OF WATER		DEPTH TO WATER	ELEV. OF WATER		DEPTH TO WATER	ELEV. OF WATER		DEPTH TO WATER	ELEV. OF WATER		DEPTH TO WATER	ELEV. OF WATER	
G5M-92-01X	PVC	240.45	Not measured	Not measured		34.31	206.14	33.62	206.83	32.66	207.79	34.03	206.42				
G5M-92-02X	PVC	224.73	Not measured	Not measured		18.09	206.64	17.37	207.36	15.39	209.34	17.51	207.22				
G5M-92-03A	PVC	238.48	Not measured	Not measured		25.81	212.67	Dry	Dry	25.88	212.6	Dry	Dry				
G5M-92-03B	PVC	239.62	Not measured	Not measured		34.09	205.53	33.17	206.45	30.78	208.84	33.7	205.92				
G6M-92-01X	PVC	265.41	Not measured	Not measured		60.44	204.97	60.34	205.07	60.1	205.31	60.22	205.19				
G6M-92-02X	PVC	271.00	Not measured	Not measured		67.84	203.16	67.1	203.9	66.59	204.41	67.63	203.37				
G6M-92-03X	PVC	269.53	Not measured	Not measured		63.1	206.43	63.37	206.16	63.09	206.44	62.2	207.33				
G6M-92-04X	PVC	270.36	Not measured	Not measured		67.78	202.58	66.44	203.92	65.59	204.77	68.2	202.16				
G6M-92-05X	PVC	268.88	Not measured	Not measured		66.01	202.87	64.79	204.09	64.35	204.53	66.43	202.45				
G6M-92-06X	PVC	263.79	Not measured	Not measured		58.35	205.44	58.29	205.5	58	205.79	58.24	205.55				
G6M-92-07X	PVC	266.86	Not measured	Not measured		59.92	206.94	60.28	206.58	59.92	206.94	59.46	207.4				
G6M-92-08X	PVC	262.94	Not measured	Not measured		54.21	208.73	Not measured	Not measured	54.31	208.63	53.47	209.47				
G6M-92-09X	PVC	261.25	Not measured	Not measured		51.44	209.81	52.04	209.21	51.67	209.58	50.92	210.33				
G6M-92-10X	PVC	225.81	Not measured	Not measured		14.12	211.69	14.08	211.73	12.38	213.43	13.26	212.55				
G6M-92-11X	PVC	225.62	Not measured	Not measured		13.75	211.87	13.84	211.78	13.23	212.39	13.07	212.55				
WWTMW-01	PVC	217.71	7.40	210.31		9.06	208.65	8.4	209.31	6.78	210.93	8.04	209.67				
WWTMW-01A	PVC	220.88	16.58	204.3		17.12	203.76	15.41	205.47	12.76	208.12	17.38	203.5				
WWTMW-02	PVC	225.73	21.86	203.87		22.28	203.45	20.58	205.15	17.69	208.04	22.71	203.02				
WWTMW-02A	PVC	225.47	21.68	203.79		22.1	203.37	20.43	205.04	16.96	208.51	22.57	202.9				
WWTMW-03	PVC	216.79	13.48	203.31		13.87	202.92	12.06	204.73	8.16	208.63	14.53	202.26				
WWTMW-04	PVC	217.79	13.04	204.75		13.74	204.05	12.19	205.6	10.57	207.22	13.98	203.81				
WWTMW-05	PVC	213.39	10.56	202.83		10.9	202.49	9.12	204.27	5.65	207.74	11.67	201.72				
WWTMW-06	PVC	234.54	13.78	220.76		18.72	215.82	17.84	216.7	Not measured	Not measured	15.43	219.11				
WWTMW-07	PVC	243.08	24.89	218.19		29.11	213.97	26.54	216.54	Not measured	Not measured	27.47	215.61				
WWTMW-08	PVC	219.43	10.08	209.35		11.54	207.89	10.83	208.6	8.83	210.6	10.6	208.83				
WWTMW-09	PVC	212.49	9.04	203.45		9.36	203.13	7.43	205.06	Not measured	Not measured	9.83	202.66				
WWTMW-10	PVC	214.74	11.52	203.22		11.84	202.9	9.91	204.83	5.75	208.99	12.3	202.44				
WWTMW-11	PVC	214.57	11.65	202.92		11.98	202.59	10.19	204.38	5.64	208.93	12.54	202.03				
WWTMW-12	PVC	221.49	17.50	203.99		17.91	203.58	16.51	204.98	14.5	206.99	18.04	203.45				
WWTMW-13	PVC	220.10	16.20	203.9		16.66	203.44	14.95	205.15	13.18	206.92	16.87	203.23				
WWTMW-14	PVC	219.14	10.34	208.8		11.19	207.95	11.57	207.57	10.11	209.03	9.84	209.3				
MNG-1	PVC	248.89	24.55	224.34		24.6	224.29	Not measured	Not measured	Not measured	Not measured	24.22	224.67				
MNG-2	PVC	238.66	20.36	218.3		20.67	217.99	20.23	218.43	19.64	219.02	20.52	218.14				
MNG-3	PVC	254.47	37.52	216.95		37.35	217.12	36.84	217.63	35.94	218.53	37.26	217.21				
MNG-4	PVC	254.37	32.80	221.57		32.98	221.39	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
MNG-5	PVC	237.21	17.28	219.93		17.48	219.73	17.58	219.63	17.14	220.07	17.27	219.94				
MNG-6	PVC	231.70	36.46	218.24		36.52	218.18	36.22	218.48	35.75	218.95	36.37	218.33				
MNG-7	PVC	250.08	31.43	218.65		31.39	218.69	31.38	218.7	31.06	219.02	Not measured	Not measured				

TABLE E-1
SYNOPTIC WATER - LEVEL MEASUREMENTS
REMEDIAL INVESTIGATION ADDENDUM REPORT
FEASIBILITY STUDY FOR GROUP 1A SITES
FORT DEVENS, MA

STATION/ WELL NO.	REF. POINT	ELEV. OF REF. PT.	MAY 26, 1992			SEPT. 15, 1992			DECEMBER 22, 1992			MARCH 30, 1993 *			JUNE 22, 1993		
			DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	ELEV. OF WATER
SWEL-01	BRIDGE RAIL	221.16	20.44	200.72	21.08	18.85	202.31	13.1	208.06	21.61	199.55						
SWEL-02	BRIDGE RAIL	217.82	15.90	201.92	16.1	13.98	203.84	7.3	210.52	16.58	201.24						
SWEL-05	CAPPED PIN	217.84		217.84	1.05	0.22	217.62	-0.8	218.64	0.86	215.14						
SHL-1	PVC		Dry	Dry	Dry	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured
SHL-3H	PVC	248.17	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured
SHL-3L	CASING	248.50	30.67	217.83	30.82	30.24	218.26	30.49	218.01	30.87	217.63						
SHL-4	PVC	228.71	11.10	217.61	11.23	10.58	218.13	10.36	218.35	11.18	217.53						
SHL-5	PVC	218.53	4.10	214.43	5.15	2.39	216.14	1.81	216.72	4.88	213.65						
SHL-6	CASING	254.17	28.80	225.37	29.11	29.38	224.79	28.76	225.41	28.7	225.47						
SHL-7	PVC	237.13	17.56	219.57	17.93	17.45	219.68	16.35	220.78	17.85	219.28						
SHL-8	PVC	221.85	7.53	214.32	8.22	7.1	214.75	6.78	215.07	8.05	213.8						
SHL-8	PVC-2-INCH	221.66	7.70	213.96	8.4	6.92	214.74	Not measured	Not measured	7.87	213.79						
SHL-9	PVC	222.86	9.15	213.71	10.01	8.21	214.65	8.03	214.83	9.62	213.24						
SHL-10	PVC	248.80	31.19	217.61	31.41	30.8	217.39	30.99	217.81	31.4	217.4						
SHL-11	PVC	236.34	18.87	217.47	19.02	18.65	217.32	18.4	217.69	18.96	217.38						
SHL-12	PVC	249.51	23.25	226.26	23.59	23.88	225.63	22.38	227.13	22.96	226.55						
SHL-13	PVC	221.58	7.05	214.53	7.66	6.61	213.92	6.61	214.97	7.35	214.23						
SHL-15	PVC	260.75	17.92	242.83	19.42	19.08	241.67	17.12	243.63	18.22	242.53						
SHL-17	PVC	234.57	8.46	226.11	8.8	8.97	225.77	8.97	225.6	8.21	226.36						
SHL-18	PVC	238.39	19.63	218.76	19.9	19.28	218.49	19.48	218.91	19.9	218.49						
SHL-19	PVC	241.34	23.29	218.05	23.5	22.45	218.89	23.13	218.21	23.51	217.83						
SHL-20	PVC	236.84	19.24	217.6	19.47	19.07	217.37	18.89	217.95	19.35	217.49						
SHL-21	PVC	259.75	45.34	214.41	46.01	44.8	213.74	45.15	214.6	45.58	214.17						
SHL-22	PVC	220.49	6.73	213.76	7.54	5.91	212.95	5.9	214.58	7.31	213.18						
SHL-23	PVC	242.14	27.27	214.87	28.52	26.45	213.62	27.53	214.61	27.96	214.18						
SHL-24	PVC	239.60	16.92	222.68	16.78	16.74	222.82	15.89	223.71	16.5	223.1						
SHL-25	PVC	258.87	24.68	234.19	26.78	26.86	232.01	24.24	234.63	24.95	233.92						
SHM-93-01A	PVC	243.4	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured
SHM-93-10C	PVC	248.79	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured
SHM-93-18B	PVC	238.39	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured
SHM-93-22C	PVC	219.76	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured
SHM-93-24A	PVC	237.53	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured
POL-1	PVC	259.77	19.14	240.63	19.99	19.04	239.78	15.3	244.47	19.4	240.37						
POL-2	PVC	259.42	27.70	231.72	28.29	26.81	231.13	28.02	231.4	26.81	232.61						
POL-3	PVC	261.94	25.42	236.52	26.8	26.74	235.14	23.9	238.04	25.67	236.27						
B202-1	PVC	254.43	28.30	226.13	28.62	28.93	225.81	27.47	226.96	28.07	226.36						
B202-2	PVC	258.37	32.05	226.32	32.3	32.76	226.07	32.2	226.17	31.80	226.57						
B202-3	PVC	258.32	31.28	227.04	31.51	32.13	226.81	31.48	226.84	30.99	227.53						

TABLE E-1
SYNOPTIC WATER - LEVEL MEASUREMENTS
REMEDIAL INVESTIGATION ADDENDUM REPORT
FEASIBILITY STUDY FOR GROUP 1A SITES
FORT DEVENS, MA

STATION/ WELL NO.	REF. POINT	ELEV. OF REF. PT.	MAY 26, 1992			SEPT. 15, 1992			DECEMBER 22, 1992			MARCH 30, 1993 *			JUNE 22, 1993		
			DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	ELEV. OF WATER
SWEL-04	TOP OF STAKE	218.00	Not measured	Not measured	1.1	216.9	Not measured	Not measured	Not measured	Not measured	Not measured	-0.3	218.3	4.55	215.05		
G3M-92-01X	PVC	252.49	Not measured	Not measured	25.49	227	25.85	226.64	25.47	227.02	25.11	227.38					
G3M-92-02X	PVC	251.01	Not measured	Not measured	26.28	224.73	26.5	224.51	26.17	224.84	25.93	225.08					
G3M-92-03X	PVC	250.90	Not measured	Not measured	25.92	224.98	26.47	224.43	26.15	224.75	25.52	225.38					
G3M-92-04X	PVC	252.86	Not measured	Not measured	28.53	224.33	29.09	223.77	Not measured	Not measured	Not measured	28.11	224.75				
G3M-92-05X	PVC	254.30	Not measured	Not measured	29.79	224.51	30.4	223.9	29.85	224.45	29.36	224.94					
G3M-92-06X	PVC	253.71	Not measured	Not measured	27.18	226.53	27.84	225.87	26.8	225.42	26.72	226.99					
G3M-92-07X	PVC	251.90	Not measured	Not measured	26.88	225.02	27.25	224.65	26.8	225.1	26.48	225.42					
G3M-92-08X	PVC	333.66	Not measured	Not measured	15.77	317.89	13.69	319.97	13.1	320.56	15.95	317.71					
G3M-92-09X	PVC	357.64	Not measured	Not measured	14.43	343.21	12.91	344.73	8.08	349.56	11.85	345.79					
G3M-92-10X	PVC	348.97	Not measured	Not measured	Not measured	Not measured	9.66	339.31	8.56	340.41	12.07	336.9					
G3M-92-11X	PVC	345.16	Not measured	Not measured	Not measured	Not measured	8.01	337.15	7.67	337.49	10.16	335					
G3M-92-12X	PVC	346.16	Not measured	Not measured	Not measured	Not measured	10.58	335.58	9.59	336.57	12.02	334.14					
G3M-92-13X	PVC	345.28	Not measured	Not measured	Not measured	Not measured	9.6	335.68	6.36	338.92	10.99	334.29					
CSB-1	PVC	250.11	7.63	242.48	8.41	241.7	7.94	242.17	5.67	244.44	7.31	242.8					
CSB-2	PVC	257.77	17.62	240.15	18.92	238.85	18.55	239.22	18.22	239.55	17.48	240.29					
CSB-3	PVC	267.48	24.69	242.79	25.98	241.5	25.96	241.52	25.42	242.06	24.6	242.88					
CSB-4	PVC	247.54	3.81	243.73	3.65	243.89	3.32	244.22	3.57	243.97	3.72	243.82					
CSB-5	PVC	245.19	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	240.38					
CSB-6	PVC	246.39	3.80	242.59	5.37	241.02	3.98	242.41	3.45	242.94	3.96	242.43					
CSB-7	PVC	257.83	17.67	240.16	17.07	240.76	14.76	243.07	13.32	244.51	25.03	232.8					
CSB-8	PVC	260.77	17.54	243.23	18.93	241.84	18.76	242.01	17.1	243.67	17.64	243.13					
CSM-93-01A	PVC	256.18	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	15.56	240.62					
CSM-93-02A	PVC	264.82	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	24.56	240.26	24.73	240.09					
CSM-93-02B	PVC	264.09	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	24.78	239.31	23.99	240.1					
AAFES-01D	PVC	298.73	21.50	277.23	21.73	277	21.22	277.51	Not measured	Not measured	21.69	277.04					
AAFES-02	PVC	302.71	25.68	277.03	26.03	276.68	25.72	276.99	24.89	277.82	26.2	276.51					
AAFES-03	PVC	308.53	23.11	285.42	23.56	284.97	22.94	285.59	22.35	286.18	23.13	285.4					
AAFES-04	PVC	310.00	Dry	Dry	Dry	Dry	Dry	Dry	21.64	288.36	Not measured	Not measured					
AAFES-05	PVC	300.82	24.05	276.77	24.43	276.39	23.9	276.92	16	284.82	24.36	276.46					
AAFES-06	PVC	300.00	22.16	277.84	22.37	277.63	21.79	278.21	Not measured	Not measured	22.3	277.7					
AAFES-07	PVC	259.42	8.96	250.46	9.64	249.78	8.53	250.89	Not measured	Not measured	9.14	250.28					
3622W-01	PVC	364.11	10.81	353.3	15.33	348.78	13.38	350.73	5.89	358.22	15.03	349.08					
3622W-02	PVC	362.22	10.84	351.38	13.27	348.95	11.54	350.68	4.1	358.12	13.43	348.79					
3622W-03	PVC	362.50	11.30	351.2	13.34	349.16	11.25	351.25	3.58	358.92	12.38	350.12					
3622W-04	PVC	363.57	6.80	356.77	10.25	353.32	6	357.57	Not measured	Not measured	7.81	355.76					
3602W-01	PVC	356.19	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	6.48	349.71	8.22	347.97					
3602W-02	PVC	356.58	9.09	347.49	10.98	345.6	Not measured	Not measured	7.45	349.13	10.31	346.27					

TABLE E-1
SYNOPTIC WATER - LEVEL MEASUREMENTS
REMEDIAL INVESTIGATION ADDENDUM REPORT
FEASIBILITY STUDY FOR GROUP 1A SITES
FORT DEVENS, MA

STATION/ WELL NO.	REF. POINT	ELEV. OF REF. PT.	MAY 26, 1992			SEPT. 15, 1992			DECEMBER 22, 1992			MARCH 30, 1993 *			JUNE 22, 1993		
			DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER
3602W-03	PVC	356.82	8.96	347.86	10.98	345.84	10.6	346.22	8.65	348.17	9.15	347.67					
3602W-04	PVC	355.40	7.46	347.94	8.85	346.55	5.8	349.6	4.38	351.02	7.91	347.49					
GE-01	PVC	356.89	15.81	321.08	18.46	318.43	13.4	323.49	12.66	324.23	18.17	318.72					
GE-02	PVC	355.31	11.23	324.08	12.64	322.67	8.84	326.47	12.37	327.27	12.65	322.66					
GE-03	PVC	339.64	12.81	326.83	13.57	326.07	11.16	328.48	15.94	332.95	13.89	325.75					
UST-01	CASING	348.89	16.62	332.27	17.45	331.44	15.47	333.42	18	331.51	19.66	329.85					
UST-02	PVC	349.51	18.05	331.46	19.44	330.07	17.39	332.12	18	331.51	19.66	329.85					
NBC-1	PVC	334.44	9.50	324.94	10.06	324.38	6.97	327.47	10.5	321.54	11.04	321					
NBC-2	PVC	332.44	Dry		11.22	321.22	Dry		10.5	321.54	11.04	321					
NBC-3	PVC	332.04	10.42	321.62	Dry		8.32	323.72	10.5	321.54	11.04	321					
EA-04	PVC	252.89	23.84	229.05	24.09	228.8	24.86	228.03	24.28	228.61	23.27	229.62					
EA-05	PVC	249.89	21.29	228.6	21.53	228.36	22.26	227.63	20.73	215.4	21.95	227.94					
SWEL-03	BRIDGE RAIL	236.13	21.21	214.92	21.57	214.58	20.73	215.4	18.4	226.76	21.38	214.75					
SWEL-06	TOP OF STAKE	245.16	1.41	243.75	1.57	243.59	1.32	243.84	0.41	242.59	0.24	242.76					
SWEL-07	TOP OF STAKE	243.00	1.39	241.61	2.15	240.85	Not measured	242.11	-0.15	242.64	-0.66	242.62					
SWEL-08	"0" MARK ON STAFF	241.96	-0.33	242.29	0.3	241.66											
G3D-92-01X	TOP OF 1" GALV PIPE	221.00	Not measured	Not measured	Not measured	Not measured	1.58	219.42	Not measured	Not measured	Not measured	Not measured					
1-1	PVC	258.15	24.52	233.63	25.51	232.64	26.55	231.6	25.7	232.45	24.21	233.94					
1-2	PVC	256.76	23.71	233.05	24.69	232.07	25.46	231.3	24.68	232.08	23.42	233.34					
1-3	PVC	258.68	25.43	233.25	26.42	232.26	27.18	231.5	26.4	232.28	25.18	233.5					
1-4	PVC	259.94	26.13	233.81	27.04	232.9	28.02	231.92	27.3	232.64	25.82	234.12					
2-1	PVC	263.31	19.91	243.4	20.23	243.08	21.16	242.15	20.17	243.14	19.25	244.06					
2-2	PVC	264.19	20.74	243.45	21.12	243.07	22.03	242.16	21	243.19	20.03	244.16					
2-3	PVC	264.08	21.14	242.94	21.58	242.5	22.55	241.53	21.57	242.51	20.51	243.57					
2-4	PVC	263.56	20.43	243.13	20.81	242.75	21.7	241.86	20.73	242.83	19.8	243.76					
3-1	PVC	336.55	20.12	316.43	21.1	315.45	21.75	314.8	Not measured	Not measured	19.64	316.91					
3-2	PVC	335.75	19.32	316.43	20.32	315.43	21.04	314.71	Not measured	Not measured	18.81	316.94					
3-3	PVC	334.89	18.21	316.68	19.22	315.67	19.92	314.97	Not measured	Not measured	17.68	317.21					
3-4	PVC	335.06	18.30	316.76	19.3	315.76	19.92	315.14	Not measured	Not measured	17.8	317.26					
EOD-1	PVC	349.89	18.90	330.99	20.81	329.08	20.45	329.44	18.76	331.13	19.52	330.37					
EOD-2	PVC	349.93	25.30	324.63	25.41	324.52	25.6	324.33	25.88	324.05	25.16	324.77					
EOD-3	PVC	343.67	26.43	317.24	Dry		Dry										
EOD-4	PVC	352.12	31.23	320.89	32.91	319.21	34.75	317.37	32.21	319.91	30.24	320.14					
12M-92-01X	PVC	266.32	Not measured	Not measured	46.78	219.54	46.32	220	45.12	221.2	46.46	219.86					
27M-92-01X	PVC	244.86	Not measured	Not measured	12.49	232.37	13.25	231.61	Not measured	Not measured	11.27	233.59					

TABLE E-1
SYNOPTIC WATER - LEVEL MEASUREMENTS
REMEDIAL INVESTIGATION ADDENDUM REPORT
FEASIBILITY STUDY FOR GROUP 1A SITES
FORT DEVENS, MA

STATION/ WELL NO.	REF. POINT	ELEV. OF REF. PT.	MAY 26, 1992			SEPT. 15, 1992			DECEMBER 22, 1992			MARCH 30, 1993 *			JUNE 22, 1993		
			DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	ELEV. OF WATER	
27M-92-02X	PVC	251.97	Not measured	Not measured	17.51	234.46	18.75	233.22	234.27	17.7	234.27	16.02	235.95				
27M-92-03X	PVC	255.34	Not measured	Not measured	19.6	235.74	20.95	234.39	Not measured	Not measured	18.00	237.34					
27M-92-04X	PVC	254.81	Not measured	Not measured	20.13	234.68	21.42	233.39	234.46	20.35	234.46	18.63	236.18				
28M-92-01X	PVC	247.64	Not measured	Not measured	9.59	238.05	9.35	238.29	242.02	5.62	242.02	8.03	239.61				
28M-92-02X	PVC	245.54	Not measured	Not measured	8.62	236.92	8.03	237.51	239.36	6.18	239.36	7.22	238.32				
28M-92-03X	PVC	241.72	Not measured	Not measured	14.1	227.62	13.38	228.34	233.47	8.25	233.47	13.67	228.05				
28M-92-04X	PVC	244.31	Not measured	Not measured	8.62	235.69	8.02	236.29	239.11	5.2	239.11	7.48	236.83				
41M-92-01X	PVC	249.58	Not measured	Not measured	26.92	222.66	25.0	224.58	224.9	24.68	224.9	25.92	223.66				
SWEL-09	BRIDGE RAIL	235.51	20.53	214.98	21.94	213.57	Not measured	Not measured	219.91	15.6	219.91	20.85	214.66				
SWEL-10	TOP OF STAKE	224.00	1.28	222.72	1.35	222.65	2.7	221.3	221.1	2.9	221.1	Not measured	Not measured				
SWEL-11	BRIDGE RAIL	233.47	18.01	215.46	Not measured	Not measured	16.81	216.66	223.02	10.45	223.02	Not measured	Not measured				
SWEL-12	TOP OF STAKE	226.00	1.59	224.41	Not measured	Not measured	1.4	224.6	225.05	0.95	225.05	Not measured	Not measured				
SWEL-13	TOP OF STAKE	238.00	1.20	236.8	Not measured	Not measured	0.8	237.2	Not measured	Not measured	Not measured	Not measured	Not measured				
SWEL-14	TOP OF STAKE	318.30	1.37	316.93	Not measured	Not measured	1.6	316.7	316.85	1.45	316.85	Not measured	Not measured				
SWEL-15	TOP OF STAKE	241.00	Not measured	Not measured	2.13	238.87	2.9	238.1	238.6	2.4	238.6	Not measured	Not measured				
PATTON PROD	FLOOR/PUMP	252.97	39.00	213.97	Not measured	Not measured	Not measured	Not measured	238.47	14.5	238.47	Not measured	Not measured				
	FLOOR/STATIC	252.97	14.50	238.47	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
McPHERSON	FLOOR/PUMP	221.49	35.00	186.49	Not measured	Not measured	39	182.49	213.49	8	213.49	Not measured	Not measured				
PRODUCTION	FLOOR/STATIC	221.49	10.00	211.49	Not measured	Not measured	9	212.49	Not measured	Not measured	Not measured	Not measured	Not measured				
SHEBOKEN	FLOOR/PUMP	244.32	26.20	218.12	Not measured	Not measured	26.2	218.12	230.92	13.4	230.92	Not measured	Not measured				
PRODUCTION	FLOOR/STATIC	244.32	12.00	232.32	Not measured	Not measured	14.8	229.52	Not measured	Not measured	Not measured	Not measured	Not measured				
SOUTH POST	FLOOR/PUMP		Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
WATER POINT	FLOOR/STATIC		Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
25M-92-05X	PVC	347.1	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
25M-92-06X	PVC	357.7	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
25M-92-07X	PVC	371.2	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
25M-92-08X	PVC	379.4	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
26M-92-01X	PVC	331.3	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
26M-92-02X	PVC	314.0	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
26M-92-03X	PVC	317.15	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
26M-92-04X	PVC	330.62	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
26M-92-05X	PVC	296.59	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
26M-92-06X	PVC	302.59	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
26M-92-07X	PVC	326.75	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
32M-92-01X	PVC	260.93	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
32M-92-02X	PVC	261.98	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
32M-92-03X	PVC	260.99	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				
32M-92-04X	PVC	262.28	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured				

TABLE E-1
SYNOPTIC WATER - LEVEL MEASUREMENTS
REMEDIAL INVESTIGATION ADDENDUM REPORT
FEASIBILITY STUDY FOR GROUP 1A SITES
FORT DEVENS, MA

STATION/ WELL NO.	REF. POINT	ELEV. OF REF. PT.	MAY 26, 1992			SEPT. 15, 1992			DECEMBER 22, 1992			MARCH 30, 1993 *			JUNE 22, 1993		
			DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER	DEPTH TO WATER	ELEV. OF WATER	DEPTH TO WATER
32M-92-05X	PVC	262.04	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	10.25	251.79	17.44	244.6		
32M-92-06X	PVC	261.69	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	7.58	254.11	14.35	247.34		
32M-92-07X	PVC	260.86	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	12.87	247.99	14.73	246.13		

* AT THE TIME OF THE MARCH 30, 1993 SYNOPTIC WATER - LEVEL MEASUREMENT ROUND, FORT DEVENS WAS EXPERIENCING A FLOOD EVENT.

SURVEY COORDINATES

**APPENDIX F
SURVEY COORDINATES**

**REMEDIAL INVESTIGATION ADDENDUM REPORT
FEASIBILITY STUDY FOR GROUP 1A SITES
FORT DEVENS, MA**

SITE ID	NORTHING	EASTING	GROUND ELEVATION	TOP OF RISER ELEV.
SHM-93-01A	566045	474380	241.7	243.40
SHM-93-10C	566178	574580	247.1	248.79
SHM-93-18B	585785	574881	236.2	238.38
SHM-93-22C	573189	567328	217.9	219.76
SHM-93-24A	564978	575005	235.5	237.53
SHL-3 (1)	566038	574614	NOT MEASURED	NOT MEASURED
SHL-5 (1)	567458	573895	NOT MEASURED	NOT MEASURED
SHL-11 (1)	566650	574197	NOT MEASURED	NOT MEASURED
SHL-19 (1)	566280	574369	NOT MEASURED	NOT MEASURED
SHL-20 (1)	566662	574164	NOT MEASURED	NOT MEASURED
SHL-22 (1)	567496	573760	NOT MEASURED	NOT MEASURED
SHL-23 (1)	567250	573415	NOT MEASURED	NOT MEASURED
SWEL-04 (1)	566091	574995	219.6	N/A
CSM-93-01A	557742	572214	254.9	256.18
CSM-93-02A	557498	571777	262.7	264.82
CSM-93-02B	557502	571763	262.5	264.09
CSB-2 (1)	557639	571861	256.0	257.77
CSB-3 (1)	557542	572211	NOT MEASURED	NOT MEASURED
CSB-4 (1)	557769	572182	NOT MEASURED	NOT MEASURED
CSB-5	557805	572245	242.4	145.19
CSB-7 (1)	557994	573016	NOT MEASURED	NOT MEASURED
CSB-8 (1)	557683	572468	NOT MEASURED	NOT MEASURED
PATTON WELL (2)	557347	571411	250.6	241.09
SWEL-05 (1)	NOT MEASURED	NOT MEASURED	216.0	N/A
SHD-92-01X	566521	574371	NOT MEASURED	NOT MEASURED
SHD-92-02X	566100	574744	NOT MEASURED	NOT MEASURED
SHD-92-03X	566478	574693	NOT MEASURED	NOT MEASURED
SHD-92-04X	566720	574457	NOT MEASURED	NOT MEASURED
SHD-92-05X	566179	575037	NOT MEASURED	NOT MEASURED
SHD-92-06X	566329	574960	NOT MEASURED	NOT MEASURED
SHD-92-07X	566476	574820	NOT MEASURED	NOT MEASURED
SHD-92-08X	566594	574869	NOT MEASURED	NOT MEASURED
SHD-92-09X	566789	574608	NOT MEASURED	NOT MEASURED
SHD-92-10X	567035	574493	NOT MEASURED	NOT MEASURED
SHD-92-11X	566254	575285	NOT MEASURED	NOT MEASURED
SHD-92-12X	566411	575213	NOT MEASURED	NOT MEASURED
SHD-92-13X	566554	575096	NOT MEASURED	NOT MEASURED
SHD-92-14X	566685	574997	NOT MEASURED	NOT MEASURED
SHD-92-15X	566901	574835	NOT MEASURED	NOT MEASURED
SHD-92-16X	567086	574689	NOT MEASURED	NOT MEASURED
SHD-92-17X	567255	574573	NOT MEASURED	NOT MEASURED
SHD-92-18X	567236	574509	NOT MEASURED	NOT MEASURED
SHD-92-19X	566608	575359	NOT MEASURED	NOT MEASURED
SHD-92-20X	566747	575223	NOT MEASURED	NOT MEASURED
SHD-92-21X	566812	575614	NOT MEASURED	NOT MEASURED
SHD-92-22X	566822	575408	NOT MEASURED	NOT MEASURED
SHD-92-23X	566900	575294	NOT MEASURED	NOT MEASURED

**APPENDIX F
SURVEY COORDINATES**

**REMEDIAL INVESTIGATION ADDENDUM REPORT
FEASIBILITY STUDY FOR GROUP 1A SITES
FORT DEVENS, MA**

SITE ID	NORTHING	EASTING	GROUND ELEVATION	TOP OF RISER ELEV.
SHD-92-24X	567150	575283	NOT MEASURED	NOT MEASURED
SHD-92-25X	567488	575351	NOT MEASURED	NOT MEASURED
SHD-92-26X	566530	575407	NOT MEASURED	NOT MEASURED
SHD-92-27X	566442	574647	NOT MEASURED	NOT MEASURED
SHD-92-28X	566629	574371	NOT MEASURED	NOT MEASURED
SHD-92-29X	567658	574092	NOT MEASURED	NOT MEASURED
SHD-92-30X	567730	574065	NOT MEASURED	NOT MEASURED
SHD-92-31X	567687	573803	NOT MEASURED	NOT MEASURED
SHD-92-32X	567729	573713	NOT MEASURED	NOT MEASURED
GRW-92-01X	566182	575637	NOT MEASURED	NOT MEASURED
GRW-92-02X	566366	575594	NOT MEASURED	NOT MEASURED
GRW-92-03X	566701	575680	NOT MEASURED	NOT MEASURED
GRW-92-04X	564783	575621	NOT MEASURED	NOT MEASURED
GRW-92-05X	565332	575589	NOT MEASURED	NOT MEASURED
CSD-92-01X	558257	573064	NOT MEASURED	NOT MEASURED
CSD-92-02X	558212	573066	NOT MEASURED	NOT MEASURED
CSD-92-03X	558159	572947	NOT MEASURED	NOT MEASURED
CSD-92-04X	558254	572946	NOT MEASURED	NOT MEASURED
CSD-92-05X	558251	572814	NOT MEASURED	NOT MEASURED
CSD-92-06X	558019	572667	NOT MEASURED	NOT MEASURED
CSD-92-07X	557840	572291	NOT MEASURED	NOT MEASURED
CSD-92-08X	572259	557833	NOT MEASURED	NOT MEASURED
CSD-92-09X	557871	572240	NOT MEASURED	NOT MEASURED
CSD-92-10X	557905	572162	NOT MEASURED	NOT MEASURED
CSD-92-11X	557823	571902	NOT MEASURED	NOT MEASURED
CSD-92-12X	557906	571889	NOT MEASURED	NOT MEASURED
CSD-92-13X	557932	572794	NOT MEASURED	NOT MEASURED
CSD-92-14X	557865	572295	NOT MEASURED	NOT MEASURED
CSD-92-15X	557990	572584	NOT MEASURED	NOT MEASURED
CSD-92-16X	558158	572953	NOT MEASURED	NOT MEASURED
MAD-92-01X	557933	571851	NOT MEASURED	NOT MEASURED
MAD-92-02X	557939	571676	NOT MEASURED	NOT MEASURED
MAD-92-03X	557985	571348	NOT MEASURED	NOT MEASURED

NOTES:

- (1) = SITES WERE PREVIOUSLY SURVEYED, HISTORICAL SURVEY DATA MAY NOT AGREE
 (2) = COORDINATES ARE NORTHEAST CORNER OF BUILDING;
 ELEVATIONS ARE FIRST FLOOR OF WELL HOUSE AND BASEMENT CASING

FORT DEVENS PROJECT ANALYTE LIST

ABB Environmental Services, Inc.

FORT DEVENS PROJECT ANALYTE LIST

Project Analyte List Inorganics

AL	ALUMINUM
SB	ANTIMONY
AS	ARSENIC
BA	BARIUM
BE	BERYLLIUM
CD	CADMIUM
CA	CALCIUM
CR	CHROMIUM
CO	COBALT
CU	COPPER
FE	IRON
PB	LEAD
MG	MAGNESIUM
MN	MANGANESE
HG	MERCURY
NI	NICKEL
K	POTASSIUM
SE	SELENIUM
AG	SILVER
NA	SODIUM
TL	THALLIUM
V	VANADIUM
ZN	ZINC

Project Analyte List Explosives

135TNB	1,3,5-TRINITROBENZENE
13DNB	1,3-DINITROBENZENE
246TNT	2,4,6-TRINITROTOLUENE
24DNT	2,4-DINITROTOLUENE
26DNT	2,6-DINITROTOLUENE
HMX	CYCLOTETRAMETHYLENETETRANITRAMINE
NB	NITROBENZENE
RDX	CYCLONITE
TETRYL	NITRAMINE
NG	NITROGLYCERINE
PETN	PENTAERYTHRITOL TETRANITRATE

ABB Environmental Services, Inc.

APPENDIX G

Project Analyte List Anions/Cations

HCO ₃	BICARBONATE
CL	CHLORIDE
SO ₄	SULFATE
NO ₃	NITRATE
CA	CALCIUM
K	POTASSIUM
MG	MAGNESIUM

Project Analyte List Water Quality Parameters

CL	CHLORIDES
N ₂ KJEL	TOTAL NITROGEN
NIT	NO ₃ -N
SO ₄	SULFATES
TPO ₄	TOTAL PHOSPHORUS
--	HARDNESS
ALK	ALKALINITY
TSS	TOTAL SUSPENDED SOLIDS
DO	DISSOLVED OXYGEN
	COLIFORM

Project Analyte List Organics

Volatile Organic Compounds:

111TCE	1,1,1-TRICHLOROETHANE
112TCE	1,1,2-TRICHLOROETHANE
11DCE	1,1-DICHLOROETHYLENE / 1,1-DICHLOROETHENE
11DCLE	1,1-DICHLOROETHANE
12DCE	1,2-DICHLOROETHYLENES, TOTAL (CIS AND TRANS ISOMERS)
12DCLE	1,2-DICHLOROETHANE
12DCLP	1,2-DICHLOROPROPANE
ACET	ACETONE
BRDCLM	BROMODICHLOROMETHANE
C ₂ AVE	ACETIC ACID, VINYL ETHER/VINYL ACETATE
C ₂ H ₃ CL	CHLOROETHENE / VINYL CHLORIDE
C ₂ H ₅ CL	CHLOROETHANE
C ₆ H ₆	BENZENE
CCL ₄	CARBON TETRACHLORIDE
CH ₃ BR	BROMOMETHANE
CH ₃ CL	CHLOROMETHANE
CHBR ₃	BROMOFORM

ABB Environmental Services, Inc.

C13DCP	CIS-1,3-DICHLOROPROPYLENE C+S-1,3-DICHLOROPROPENE
CHCL3	CHLOROFORM
CL2CH2	DICHLOROMETHANE/METHYLENE CHLORIDE
CLC6H5	CHLOROBENZENE
CS2	CARBON DISULFIDE
DBRCLM	DIBROMOCHLOROMETHANE
ETC6H5	ETHYLBENZENE
MEC6H5	TOLUENE
MEK	METHYLETHYL KETONE / 2-BUTANONE
MIBK	METHYLISOBUTYL KETONE
MNBK	METHYL-N-BUTYL KETONE / 2-HEXANONE
STYR	STYRENE
T13DCP	TRANS-1,3-DICHLOROPROPENE
TCLEA	1,1,2,2-TETRACHLOROETHANE
TCLEE	TETRACHLOROETHYLENE / TETRACHLOROETHENE
TRCLE	TRICHLOROETHYLENE / TRICHLOROETHENE
TXYLEN	XYLENES, TOTAL COMBINED

Project Analyte List Organics**Semivolatile Compounds:**

124TCB	1,2,4-TRICHLOROBENZENE
12DCLB	1,2-DICHLOROBENZENE
13DCLB	1,3-DICHLOROBENZENE
14DCLB	1,4-DICHLOROBENZENE
245TCP	2,4,5-TRICHLOROPHENOL
246TCP	2,4,6-TRICHLOROPHENOL
24DCLP	2,4-DICHLOROPHENOL
24DMPN	2,4-DIMETHYLPHENOL
24DNP	2,4-DINITROPHENOL
24DNT	2,4-DINITROTOLUENE
26DNT	2,6-DINITROTOLUENE
2CLP	2-CHLOROPHENOL
2CNAP	2-CHLORONAPHTHALENE
2MNAP	2-METHYLNAPHTHALENE
2MP	2-METHYLPHENOL / 2-CRESOL
2NANIL	2-NITROANILINE
2NP	2-NITROPHENOL
33DCBD	3,3'-DICHLOROBENZIDINE
3NANIL	3-NITROANILINE
46DN2C	4,6-DINITRO-2-CRESOL / METHYL-4,6-DINITROPHENOL
4BRPPE	4-BROMOPHENYLPHENYL ETHER

ABB Environmental Services, Inc.

APPENDIX G

4CANIL	4-CHLOROANILINE
4CL3C	4-CHLORO-3-CRESOL / 3-METHYL-4-CHLOROPHENOL
4CLPPE	4-CHLOROPHENYLPHENYL ETHER
4MP	4-METHYLPHENOL / 4-CRESOL
4NANIL	4-NITROANILINE
4NP	4-NITROPHENOL
ANAPNE	ACENAPHTHENE
ANAPYL	ACENAPHTHYLENE
ANTRC	ANTHRACENE
B2CEXM	BIS (2-CHLOROETHOXY) METHANE
B2CIPE	BIS (2-CHLOROISOPROPYL) ETHER
B2CLEE	BIS (2-CHLOROETHYL) ETHER/2,2'-OXYBIS(1-OHLOROPROPANE)
B2EHP	BIS (2-ETHYLHEXYL) PHTHALATE
BAANTR	BENZO [A] ANTHRACENE
BAPYR	BENZO [A] PYRENE
BBFANT	BENZO [B] FLUORANTHENE
BBZP	BUTYLBENZYL PHTHALATE
BGHIPY	BENZO [G,H,I] PERYLENE
BKFANT	BENZO [K] FLUORANTHENE
BZALC	BENZYL ALCOHOL
CARBAZ	CARBAZOLE
CHRY	CHRYSENE
CL6BZ	HEXACHLOROBENZENE
CL6CP	HEXACHLOROCYCLOPENTADIENE
CL6ET	HEXACHLOROETHANE
DBAHA	DIBENZ [A,H] ANTHRACENE
DBZFUR	DIBENZOFURAN
DEP	DIETHYL PHTHALATE
DMP	DIMETHYL PHTHALATE
DNBP	DI-N-BUTYL PHTHALATE
DNOP	DI-N-OCTYL PHTHALATE
FANT	FLUORANTHENE
FLRENE	FLUORENE
HCBD	HEXACHLOROBUTADIENE
ICDPYR	INDENO [1,2,3-C,D] PYRENE
ISOPHR	ISOPHORONE
NAP	NAPHTHALENE
NB	NITROBENZENE
NNDNPA	N-NITROSO DI-N-PROPYLAMINE
NNDPA	N-NITROSO DIPHENYLAMINE
PCP	PENTACHLOROPHENOL
PHANTR	PHENANTHRENE
PHENOL	PHENOL
PYR	PYRENE

ABB Environmental Services, Inc.

Project Analyte List Organics

Pesticides and PCBs:

ABHC ALPHA-BENZENEHEXACHLORIDE / ALPHA-HEXACHLOROCYCLOHEXANE
ACLDAN ALPHA CHLORDANE
AENSLF ALPHA-ENDOSULFAN / ENDOSULFAN I
ALDRN ALDRIN
BBHC BETA-BENZENEHEXACHLORIDE / BETA-HEXACHLOROCYCLOHEXANE
BENSLF BETA-ENDOSULFAN / ENDOSULFAN II
DBHC DELTA-BENZENEHEXACHLORIDE / DELTA-HEXACHLOROCYCLOHEXANE
DLDRN DIELDRIN
ENDRN ENDRIN
ENDRNA ENDRIN ALDEHYDE
ENDRNK ENDRIN KETONE
ESFSO4 ENDOSULFAN SULFATE
GCLDAN GAMMA-CHLORDANE
HPCL HEPTACHLOR
HPCLE HEPTACHLOR EPOXIDE
LIN LINDANE / GAMA-BENZENEHEXACHLORIDE /
GAMMA-HEXACHLOROCYCLOHEXANE
MEXCLR METHOXYCHLOR
PCB016 PCB 1016
PCB221 PCB 1221
PCB232 PCB 1232
PCB242 PCB 1242
PCB248 PCB 1248
PCB254 PCB 1254
PCB260 PCB 1260
PPDDD 2,2-BIS (PARA-CHLOROPHENYL)-1,1-DICHLOROETHANE
PPDDE 2,2-BIS (PARA-CHLOROPHENYL)-1,1-DICHLOROETHENE
PPDDT 2,2-BIS (PARA-CHLOROPHENYL)-1,1,1-TRICHLOROETHANE
TXPHEN TOXAPHENE